United States Air Force
611th Air Support Group/
Civil Engineering Squadron

Elmendorf AFB, Alaska

Final

Remedial Investigation and Feasiblity Study

Point Lay Radar Installation, Alaska

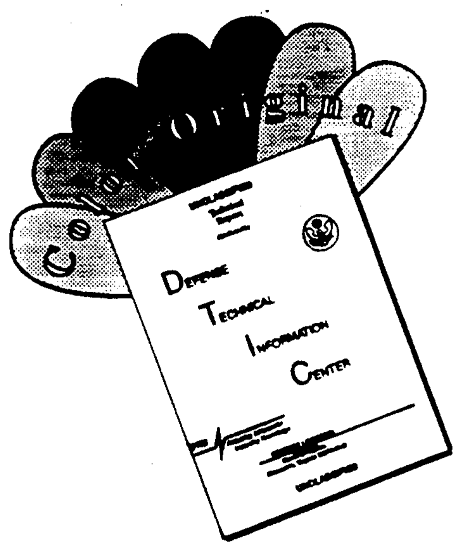
Prepared by:

ICF Technology Incorporated

04 MARCH 1996

THIS PAGE INTENTIONALLY LEFT BLANK

DISCLAIMER NOTICE



THIS DOCUMENT IS BEST QUALITY AVAILABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF COLOR PAGES WHICH DO NOT REPRODUCE LEGIBLY ON BLACK AND WHITE MICROFICHE.

PREFACE

This report presents the findings of Remedial Investigations and Feasiblity Studies at sites located at the Point Lay radar installation in northern Alaska. The sites were characterized based on sampling and analyses conducted during Remedial Investigation activities performed during August and September 1993. This report was prepared by ICF Technology Incorporated.

This report was prepared between May 1995 and March 1996. Mr. Samer Karmi of the Air Force Center for Environmental Excellence was the Alaska Restoration Team Chief for this task. Dr. Jerome Madden and Mr. Richard Borsetti of the 611th CES/CEVR were Remedial Project Managers for this project.

Approved:

Thomas McKinney
Program Director
ICF Technology Incorporated

THIS PAGE INTENTIONALLY LEFT BLANK

NOTICE

This report has been prepared for the United States Air Force (Air Force) by ICF Technology Incorporated for the purpose of aiding in the implementation of final remedial actions under the Air Force Installation Restoration Program (IRP). As the report relates to actual or possible releases of potentially hazardous substances, its release prior to an Air Force final decision on remedial action may be in the public's interest. The limited objectives of this report and the ongoing nature of the IRP, along with the evolving knowledge of site conditions and chemical effects on the environment and health, must be considered when evaluating this report, since subsequent facts may become known which may make this report premature or inaccurate. Acceptance does not mean that the United States Air Force adopts the conclusions, recommendations or other views expressed herein, which are those of the contractor only and do not necessarily reflect the official position of the United States Air Force.

Government agencies and their contractors registered with the Defense Technical Information Center (DTIC) should direct requests for copies of this report to: DTIC, Cameron Station, Alexandria, Virginia 22304-6145.

Non-Government agencies may purchase copies of this document from: National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22161.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

LIST OF TABLES (CONTINUED)

LIST OF FIGURES

EXECUTIVE SUMMARY

BACKGROUND

The United States Air Force (Air Force) has prepared this Remedial Investigation/Feasibility Study (RI/FS) report as part of the Installation Restoration Program (IRP) to present results of RI/FS activities at four sites at the Point Lay radar installation. The IRP provides for investigating, quantifying, and remediating environmental contamination from past waste management activities at Air Force installations throughout the United States. The IRP is a four-phase program that approximates the remedial investigation (RI) and corrective action program used by the U.S. Environmental Protection Agency (EPA) for addressing contaminated sites that may pose a risk to human health or the environment.

The Air Force initiated IRP activities at the Point Lay radar installation in 1980 in response to the Department of Defense's (DOD's) commitment to identify past waste disposal sites and eliminate hazards to public health. The initial Phase I conducted by the Air Force concluded that past waste management activities at the installation may have resulted in adverse environmental impacts at several sites (CH2M Hill 1981).

In 1986, the Air Force initiated Phase II activities designed to confirm and quantify the nature and extent of environmental impairment identified during Phase I. Phase II activities involved limited field investigations of specific sites that were identified in the Phase I Installation Assessment/Record Search activities (Dames and Moore 1986,1987).

The Air Force's IRP Decision Document for Point Lay of 1989 (Woodward-Clyde 1989) concluded that no further action was needed at the four Point Lay sites. However, correspondence from Alaska Department of Environmental Conservation (ADEC) personnel to Air Force personnel in November 1991 (ADEC 1991) disagreed with the no further action conclusion. The correspondence stated that further investigation was needed and that corrective action appeared necessary because of improper waste disposal practices and other issues.

A private contractor prepared the Environmental Assessment for the North Warning System (Alaska) in January 1987 (Hart Crowser 1987). The report discussed the impacts of retrofitting with long range radar equipment at the Point Lay DEW Line facility, also referred to as LIZ-2.

The Air Force initiated RI/FS activities at the Point Lay radar installation in the summer of 1993. During the initial scoping activities, which included record searches, personnel interviews, and physical inspection of the installation, the Air Force and ADEC personnel concluded that four sites warranted investigation under the IRP. The four sites included several of the previously identified and investigated sites that were determined still to be of concern. This document is a detailed presentation of RI activities and provides conclusions and recommendations for addressing environmental conditions at the four Point Lay sites. Remedial actions are recommended for all four of the sites, and remedial alternatives for cleanup of these sites are evaluated in the feasibility study (FS) section of this document.

INSTALLATION DESCRIPTION

The Point Lay radar installation is located at 69°43'N, 163°00'W in the western portion of the Arctic Coastal Plain, on the east shoreline of Kasegaluk Lagoon, immediately south of the village of Point Lay (Figure 1-1, page 1-5). The installation has been active since 1955 and occupies 1,442 acres (Figure 1-2, page 1-7).

Point Lay radar installation, also known as LIZ-2, was constructed as an auxiliary station. Initially it consisted of one 24-module train, rotating radar, and support facilities. Facilities at the DEW Line station are the most prominent feature of the area. Facilities include a radome, four 30-foot communications antennas, warehouse, fuel storage tanks, hangar, 3,519-foot long weighted gravel runway, and associated gravel roads and pads.

Temperatures at the Point Lay installation are generally low throughout the year, with summer temperatures ranging from 32°F to 53°F and winter temperatures from -27°F to -5°F (Hart Crowser 1987). Precipitation at Point Lay averages 7 inches per year; snowfall is about 21 inches per year. Permafrost at the installation area is up to 1,300 feet thick. Due to the permafrost, polygonal surface patterns are abundant.

The hydrology of the installation is controlled by the relatively low topography and permafrost. Even with the low precipitation rates, the tundra is predominantly swampy. Small streams drain the several large and small lakes and swampy land occurring around the installation.

Point Lay is predominantly covered by a thin tundra mat, beneath which is a layer of sand and loess (wind blown silt) approximately two to three feet thick. Underlying these deposits are lenses and layers of marine and alluvial clay, silt, sand, and sandy gravel.

The vegetative habitat types at Point Lay support a variety of wildlife. Areas in the vicinity of the installation provide habitat important to birds, mammals, and fish.

PROJECT ACTIVITIES

The Air Force conducted RI/FS field activities at four sites at the Point Lay radar installation during 1993. The objectives of the Point Lay RI/FS are to confirm the presence or absence of chemical contamination of the environment at the installation; define the extent and magnitude of confirmed chemical releases; gather adequate data to determine the magnitude of potential risks to human health and the environment; and gather adequate data to identify and select the appropriate remedial actions for sites where apparent risks exceed acceptable limits.

The RI field activities were carried out in a three-phased approach. The three phases, installation presurvey, reconnaissance, and RI field activities, allowed contractor personnel to confirm the location of areas of environmental concern and identify sampling locations before conducting RI field activities. Four sites investigated during the RI activities include:

- Deactivated Landfill (LF01)
- Garage (SS06)

- Drainage Pathway from POL Tanks (SS07)
- Crushed Drum Area (SS08)

The site locations are shown in Figure 1-3 (page 1-9).

The RI field activities were conducted from mid-August through early September of 1993. The RI was conducted in conjunction with RIs at seven other radar installations located throughout northern Alaska. Sixteen contractor employees were stationed in Alaska for the duration of the RI. Sampling activities at the Point Lay radar installation included collection of surface and subsurface soil samples with hand tools, and collection of surface water, sediment, and landfill seep samples from drainages adjacent to potentially contaminated areas.

A total of 97 samples was collected during the 1993 RI activities at Point Lay. These included soil, sediment and surface water samples collected from the four sites as well as samples for quality assurance/quality control (QA/QC) and to establish background levels. A summary of the samples collected is presented in Table ES-1.

Analyses of samples collected during RI activities were conducted by a fixed laboratory in Anchorage, Alaska, and a temporary laboratory set up at Barrow, Alaska. Laboratory analyses conducted by the temporary laboratory were conducted on a quick turnaround basis. Analyses conducted in Anchorage, Alaska, included primarily standard turnaround but also a few quick turnaround analyses.

The Air Force conducted a risk assessment once the data had been validated and compiled. The purpose of the risk assessment was to evaluate the human and ecological health risks that may be associated with chemicals released to the environment at the sites investigated during the RI. The risk assessment characterizes the probability that measured concentrations of hazardous chemical substances will cause adverse effects in humans or the environment in the absence of remediation. The risk assessment will be used in conjunction with state and federal standards and/or guidance to determine if remediation (site cleanup) is necessary. The Point Lay Risk Assessment (U.S. Air Force 1996) was submitted under separate cover.

CHRONOLOGY OF ACTIVITIES

Project scoping documents were submitted between June and August 1993 for review by Air Force Center for Environmental Excellence (AFCEE) and regulatory agencies. These documents include the Work Plan, Sampling and Analysis Plan (SAP), Health and Safety Plan, and Community Relations Plan for seven DEW Line installations and Cape Lisburne. The installation Presurvey and the Reconnaissance trips were conducted in order to provide the information necessary to conduct the RI/FS activities. The Presurvey was conducted in May 1993 by a small group of contractor employees accompanied by Air Force representatives.

The Reconnaissance trip was completed in June 1993 by contractor employees, and AFCEE and ADEC representatives. RI field activities were conducted from mid-August through early September 1993. Sampling was conducted from the areas of least contamination to areas of increasing contamination. The sequence of sampling from least to most contaminated was

TABLE ES-1. SUMMARY OF REMEDIAL INVESTIGATION SAMPLING

SITE	MEDIUM	NUMBER OF ENVIRONMENTAL SAMPLES
Deactivated Landfill (LF01)	Soil/Sediment	13
	Surface Water	9
Garage (SS06)	Soil/Sediment	21
	Surface Water	3
Drainage Pathway from POL Tanks (SS07)	Soil/Sediment	7
	Surface Water	6
Crushed Drum Area (SS08)	Soil/Sediment	14
	Surface Water	2
Total Environmental Samples	Soil/Sediment	60
	Surface Water	22
QA/QC SAMPLES		
Ambient Condition Blanks	Water	1
Equipment Blanks	Water	3
Trip Blanks	Water	3
Replicates/Duplicates	Soil/Sediment	6
	Surface Water	2
Total Samples	Soil/Sediment	66
	Surface Water	31

based on previous sampling data, field screening, and visual observations. Field screening was used to assist in determining the areal extent of contamination and sampling locations. Where quick turnaround sample analyses indicated information gaps about the areal extent of contamination, or exposure point concentrations for potentially exposed populations were not defined, a second round of samples was collected and analyzed.

SUMMARY OF REMEDIAL INVESTIGATION/FEASIBILITY STUDY

The following paragraphs describe RI activities conducted at the four sites that are the focus of this report and summarizes the findings of the RI. Summaries of human health and ecological risks posed by chemicals detected at each site are included. The remedial alternatives are presented for the sites recommended for cleanup. The evaluation of remedial alternatives is presented in the FS, Section 4.0.

Deactivated Landfill (LF01). The Deactivated Landfill (LF01) site is located southeast of the hangar. It was the installation landfill from approximately 1973 to 1987. At the time of closure, the area was cleared of major surface debris, graded, covered with gravel, and seeded with grass. A small seasonal stream appears to be eroding the landfill cover, exposing rusty drums and landfill debris. Standing water along the landfill's western edge and surface runoff from the gravel pad area south of the hangar are possible source areas for the small stream. The water downstream from the landfill showed minor discoloration and biogenic sheen.

Sampling and analyses have determined that the Deactivated Landfill (LF01) site is contaminated with petroleum compounds and volatile organic compounds (VOCs). The contaminated media at the site include surface water, soil/sediment, and landfill debris south of the hangar. The source of contamination is suspected to be buried garbage and debris from previous waste disposal practices. The landfill has been inactive since 1987.

Migration of contaminants from the site appears to have been occurring. Affected media is estimated to be approximately 5,625 square feet of landfill material and associated soil cover. Surface water drainage is eroding into the landfill materials, and analytical data suggest that migration of contaminants is occurring.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current or future site uses. A low potential noncancer hazard was identified due to chemicals of concern (COCs) in surface water, primarily manganese; however, all the risks and hazards are based on a conservative future scenario and are not of a magnitude that requires remedial action.

Levels of diesel range petroleum hydrocarbons (DRPH), gasoline range petroleum hydrocarbons (GRPH), and VOCs detected in site surface water do exceed ADEC guidance cleanup levels, and migration of contaminants has occurred. Therefore, the site is being recommended for remedial action. The source area at the site consists of approximately 5,625 square feet (625 cubic yards) of landfill debris and soil. The remedial action alternative recommended for the site is offsite incineration. A complete description and evaluation of the remedial alternatives considered for this site are presented in the FS, Section 4.0.

Garage (SS06). The Garage (SS06) site is located approximately 250 feet north of the module train. Floor drains in this building discharged directly to the tundra beneath the structure and may have received vehicle maintenance waste. The floor drains were sealed by the Air Force in July 1993 to prevent the possibility of future release of contaminants. The Garage is an approximately 90-foot by 40-foot building elevated about 5 feet above the tundra and is surrounded by gravel on the north, east, and south sides. The building is used for vehicle maintenance and storage.

Sampling and analyses have determined that the Garage (SS06) site is contaminated with petroleum hydrocarbons [DRPH, GRPH, and residual range petroleum hydrocarbons (RRPH)], benzene, toluene, ethylbenzene, and xylene (BTEX) compounds, other VOCs that are components of diesel fuel, and solvents. The contaminated areas at the site are soil/sediment and surface water. The area beneath the Garage has the highest concentrations of affected soil. Contaminant concentrations decrease with distance from the Garage. The suspected source of contamination is petroleum, oil, and lubricant (POL) wastes previously discharged to the building floor drains.

Migration of contaminants from the site appears to have occurred via surface and subsurface pathways from the gravel pad and the area below the Garage to the surrounding gravel and tundra areas.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current site uses. Under a future scenario, using the surface water in the drainage pathways from the site as a drinking water supply results in a low potential risk to human health. The human health risk, however, is not of a magnitude that requires remedial action. The ecological risk assessment (ERA) concluded that the overall potential risks presented by site contaminants are minimal. Therefore, under current and future site conditions and considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Levels of petroleum compounds (DRPH, GRPH, and RRPH) detected in soil/sediment at the site significantly exceed ADEC guidance cleanup levels. In addition, site contaminants have migrated downgradient and have impacted soil/sediment and surface water. Therefore, the site is being recommended for remedial action. The affected areas at the site include approximately 4,000 square feet beneath the building, approximately 300 square feet of gravel between the fuel tanks south of the Garage, and approximately 27,700 square feet of tundra located southwest of the Garage. The remedial action alternative recommended for the gravel between the fuel tanks, the soil beneath the building, and the tundra is enhanced bioremediation. A complete description and evaluation of the remedial alternatives recommended for this site are presented in the FS, Section 4.0.

Drainage Pathway from POL Tanks (SS07). The Drainage Pathway from POL Tanks (SS07) is located along the bluff between the fuel storage area and the Kasegaluk Lagoon. The site consists of three small streams and a beach bluff located at the edge of the gravel pad. The gravel pad area was historically a drum storage area. An ADEC representative who inspected

this site during the reconnaissance visit felt this area appeared potentially contaminated. Styrofoam and fabric debris are partially buried in some areas along the bluff at this site.

Sampling and analyses have determined that the Drainage Pathway from POL Tanks (SS07) site is contaminated with solvents and petroleum hydrocarbons (GRPH). The affected area at the site is the surface water along the bluff and at the base of the bluff. The suspected source of contamination is related to the repainting of the POL tanks approximately two weeks prior to sample collection, but may also be attributable to a drum storage area that was formerly located on the gravel pad. Because the contaminants were detected in flowing surface water, no estimate of the volume of contamination was made.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current and future site uses. The potential human health risks at the site are not of a magnitude that requires remedial action. The ERA concluded that the overall potential risks presented by site contaminants are low. Therefore, under current and future site conditions and considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Solvents detected in surface water at the site exceed ADEC guidance cleanup levels and have migrated downgradient of the site. Therefore, the site is being recommended for remedial action. The affected area at the site is surface water at the beach bluff and the base of the bluff adjacent to Kasegaluk Lagoon. The remedial action alternative recommended for the site is monitoring. If contaminants continue to be detected at the site, then further investigation may be warranted. A complete description and evaluation of the remedial alternatives considered for this site are presented in the FS, Section 4.0.

Crushed Drum Area (SS08). The Crushed Drum Area (SS08) site is a gravel pad located approximately 150 feet northeast of the module train. The gravel pad slopes gently to the tundra north and east of the site and is adjacent to a drainage pathway that runs from below the east end of the module train to the south end of the gravel pad area at the site. It was determined that an investigation was warranted at this site because of the previous drum-crushing activities.

Sampling and analyses have determined that the Crushed Drum Area (SS08) site is contaminated with petroleum hydrocarbons (DRPH, GRPH, and RRPH), and volatile and semi-volatile organics, most of which are common components of diesel fuel. The affected areas at the site are the gravel adjacent to and below the west end of the module train and the tundra along the gravel pad northwest of the module train. The suspected source of contamination is previous spills and/or leaks from the day tanks in the west end of the module train.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current site uses. The potential human health risks at the site are not of a magnitude that requires remedial action. The ERA concluded that the overall potential risks presented by site contaminants are low. Therefore, under current site conditions and considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Levels of petroleum compounds (primarily diesel) detected in soil/sediment at the site exceed ADEC guidance cleanup levels. In addition, site contaminants have migrated downgradient of the site, and have impacted gravel, tundra areas, and surface water. Therefore, the site is being recommended for remedial action. The affected area at the site is the gravel area below and adjacent to the west end of the module train and the tundra along the gravel pad northwest of the module train. The remedial action alternative recommended for the tundra and soil beneath the building is enhanced bioremediation. A complete description and evaluation of the remedial alternatives considered for this site are presented in the FS, Section 4.0.

CONCLUSIONS

To meet the Air Force's commitment to identify, quantify, and remediate waste disposal sites at installations throughout the United States, the prime contractor completed an RI/FS at four sites at the Point Lay radar installation. The investigation was completed in accordance with the guidelines established in the Air Force's IRP. The RI/FS involved field investigations, sampling, and analysis at four sites at the Point Lay radar installation.

Based on the RI sampling and data analyses and quantitative risk assessment, the Air Force has concluded that contaminant levels do not represent a significant potential risk to receptor populations; however, contaminant concentrations do exceed ADEC cleanup guidance levels at all four of the Point Lay sites. Therefore, it is recommended that remedial actions be conducted at the four sites. The sites include the Deactivated Landfill (LF01), Garage (SS06), Drainage Pathway from POL Tanks (SS07), and Crushed Drum Area (SS08). The remedial action alternatives recommended for these four sites are presented in Table ES-2.

TABLE ES-2. SITES RECOMMENDED FOR REMEDIAL ACTION

SITE NAME	SITE ID NUMBER	MEDIUM	RECOMMENDED REMEDIAL ALTERNATIVE
Deactivated Landfill	LF01	Soil, drums and debris	Offsite incineration
Garage	SS06	Soil beneath building and associated gravel	Enhanced bioremediation
		Tundra	Enhanced bioremediation
Drainage Pathway from POL Tanks	SS07	Tundra	Monitoring
Crushed Drum Area	SS08	Tundra	Enhanced bioremediation
		Soil beneath building	Enhanced bioremediation

THIS PAGE INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

The United States Air Force (Air Force) has prepared this Remedial Investigation/Feasibility Study (RI/FS) report to present the results of RI/FS activities at four sites located at the Point Lay radar installation. The remedial investigation (RI) field activities were conducted at the Point Lay radar installation during the summer of 1993. The four sites at Point Lay were investigated because they were suspected of being contaminated with hazardous substances. The RI/FS was conducted in accordance with the requirements of the Air Force Installation Restoration Program (IRP). RI activities were conducted using methods and procedures specified in the RI/FS Work Plan, Sampling and Analysis Plan (SAP), and Health and Safety Plan (U.S. Air Force 1993a,b,c).

Section 1.0 of this report presents information concerning the objectives and implementation of the IRP, a description of the installation and the environmental setting at Point Lay, and brief background information on the four Point Lay sites. Project activities, including project objectives and scope, summaries of field and laboratory methods, methodologies for data evaluation and risk estimation, and a summary of background sampling, analytical results, and migration pathways are described in Section 2.0. Section 3.0 documents the RI sampling and analysis results on a site-by-site basis for the four sites where remedial actions may be warranted; identifies all Applicable or Relevant and Appropriate Requirements (ARARs), potential migration pathways, and receptors; summarizes the human health and ecological risks; and describes the conclusions and recommendations, including the recommended remedial alternative, for cleanup at each of the sites. Section 4.0 presents the feasibility study (FS) of potential remedial actions for the sites that may require cleanup.

The recommended actions for each of the sites, presented in Sections 3.0 and 4.0, are preliminary. The actions for each site will be determined only after review of this RI/FS document and the Point Lay Risk Assessment (U.S. Air Force 1996) by regulatory agencies and interested parties. During the decision process the public will be notified through fact sheets and public notices as to the recommended action for each site, and will be given the opportunity to comment on the proposed action for each site.

Appendix A provides references and a list of acronyms used in this document. Appendix B presents photographs of the Point Lay radar installation and sites. Appendix C is the Statement of Work describing the scope of the RI/FS activities at the Point Lay radar installation. Sample collection logs are presented in Appendix D; sample Chain-of-Custody forms are in Appendix E. Cross-reference tables and analytical data are presented in Appendix F, and data validation reports are in Appendix G.

1.1 THE UNITED STATES AIR FORCE INSTALLATION RESTORATION PROGRAM

The Air Force IRP is the basis for assessment and response action on Air Force installations under the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The Air Force IRP is designed to identify, confirm/quantify, and remedy problems associated with past and present management of hazardous substances and

hazardous wastes at Air Force facilities. CERCLA defines a hazardous substance in Section 101; the definition includes, as examples, any substance designated pursuant to Section 311(b)(2)(A) of the Federal Water Pollution Control Act (FWPCA), any element, compound, mixture, solution, or substance designated pursuant to Section 102 of CERCLA, and hazardous wastes identified pursuant to Section 3001 of the Resource Conservation and Recovery Act (RCRA). A hazardous waste, as defined in RCRA, "may pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of or otherwise managed" (Section 1004[2][B] of RCRA).

The Department of Defense (DOD) initiated the IRP in 1976 to identify, investigate, and mitigate environmental hazardous waste contamination that may be present at DOD facilities. In June 1980, DOD issued Defense Environmental Quality Program Policy Memorandum (DEQPPM) 80-6, requiring identification of past hazardous waste disposal sites at DOD agency installations. The Air Force implemented DEQPPM 80-6 in December 1980 and revised it in 1981.

Executive Order 12316 of 14 August 1981 directed the military to design its own program to remedy uncontrolled hazardous waste disposal sites consistent with the National Contingency Plan (NCP) established by CERCLA. In response to the directive, the DOD instructed its branches to identify hazardous waste disposal sites to which they contributed wastes, and to comply with environmental regulations at the installation level when implementing cleanup. DOD subsequently developed the basic IRP after which the Air Force IRP was modeled. DEQPPM 81-5 of 11 December 1981, implemented by Air Force Headquarters in January 1982, sets forth the basic authority and objectives for the Air Force programs.

The Superfund Amendments and Reauthorization Act of 1986 (SARA) augmented the scope and requirements of CERCLA and provided specific directives to federal facilities regarding investigation of waste disposal sites. Under SARA, technologies that provide permanent removal or destruction of hazardous wastes or contaminants are preferable to actions that only contain or isolate the materials. SARA also provides for greater interaction with public and state agencies and expands the role of the U.S. Environmental Protection Agency (EPA) in the evaluation of the health risks associated with contamination. SARA requires early determination of ARARs and the consideration of potential remediation alternatives at the initiation of an RI/FS. Remedial actions taken under CERCLA must comply with ARARs, which generally consist of federal, state, and local regulations. Remedial actions at facilities regulated under CERCLA are selected based on the results of an RI/FS. The RI/FS process is described in the NCP. The RI phase includes specific steps for determining the nature and extent of environmental contamination. Subsequently, the FS is implemented to evaluate alternative remedial actions prior to selection of the most appropriate action for a specific facility.

To respond to changes in the NCP brought about by SARA, the Air Force modified its IRP in November 1986 to improve continuity in the site investigation and remedial planning process for Air Force installations. In July 1987 the President signed Executive Order 12580, delegating responsibility to secretaries of various agencies to conduct site investigations and remedial actions at federal facilities. The order defined relationships between various federal and state agencies and assigned EPA the role of facilitator in resolving conflicts.

Prior to 1988 the Air Force IRP was organized into four phases, described below:

- Phase I, Installation Assessment/Records Search, identified past waste disposal sites at Air Force installations that might pose a hazard to public health or the environment. Sites identified during Phase I could be recommended for no further action, confirmation studies (Phase II), or remedial action (Phase IV).

- Phase II, Confirmation/Quantification, was intended to define and quantify contamination present at sites identified during Phase I. Stage 1 of Phase II consisted of an initial assessment, including environmental sampling, to determine whether contamination was present. Depending on the results of Stage 1, subsequent stages of investigation could be recommended to improve the characterization of site contamination.

- Phase III, Technology-Based Development, included development of new technologies for treating contaminants identified at Air Force installations. The results of Phase II investigations were used to determine the need for Phase III activities.

- Phase IV, Remedial Action, involved development and implementation of plans to remedy contamination at sites.

In 1988, the Air Force replaced the phased approach of the IRP with an approach more closely resembling the RI/FS approach used by EPA. Under this approach, Phase II investigations and Phase IV remedial action planning are conducted in a more parallel fashion to expedite implementation of site cleanups.

1.2 INSTALLATION DESCRIPTION AND ENVIRONMENTAL SETTING

Point Lay radar installation, also known as LIZ-2, has been active since 1955. The Point Lay DEW Line station is one of many DEW Line stations located across the arctic regions of North America and Greenland. The stations were designed to operate and maintain radar systems for the detection of aircraft that may be a threat to national security.

The Point Lay installation was constructed as an auxiliary station. The installation consists of one 24-module train, rotating radar, and support facilities. The rotating radar is located in the radome, which is adjacent to the module train. There are also four communications dishes located southeast of the module train. Support facilities include a garage, warehouse, hangar, and a 3,519-foot long lighted gravel runway.

A variety of past activities at the installation may have resulted in environmental contamination. The Air Force is investigating and remediating actual and potential sources of contamination through activities conducted under the IRP.

1.2.1 Physical Geography

The Point Lay radar installation is located at 69°43'N, 163°00'W in the western portion of the Arctic Coastal Plain, near the shorelines of Kasegaluk Lagoon and the Chukchi Sea, immediately south of the village of Point Lay. The 1,442-acre installation of Point Lay was constructed as an auxiliary station in 1955 as part of the DEW Line radar and communications system established along North America's border. The general location of Point Lay radar installation is shown on Figure 1-1. An area location map is presented in Figure 1-2, and a site plan is provided on Figure 1-3.

1.2.2 Climate (Meteorological Conditions and Air Quality)

The National Weather Service operates a meteorological monitoring station at Barrow, about 185 miles to the northeast. This is the closest monitoring station to the Point Lay facility, although temperature and precipitation have been measured at the Point Lay installation.

Temperatures at the Point Lay installation are generally low throughout the year, with average summer temperatures ranging from 32°F to 53°F and average winter temperatures from -27°F to -5°F. The highest temperature recorded was 78°F in July 1955, and the lowest was -55°F in March 1956 (Hart Crowser 1987).

Precipitation is very low at the Point Lay installation. The annual average precipitation is 7 inches, including 21 inches of snow. Most precipitation occurs in July and August; precipitation from October through May is mostly snow. Storms are usually from the west during the summer, when high pressure systems centered over the northern Pacific force storm tracks northward through the Bering Strait, then easterly toward the installation.

Prevailing winds are northeasterly year-round with a mean speed of 12 mph. November winds are slightly stronger than those of other months, but there is little variation in wind speed from one month to the next. Winds of 35 mph or more are not uncommon, and gusts can occasionally attain much greater speeds.

No air quality measurements have been conducted in the area, but air quality is expected to be good because there are no significant emission sources.

1.2.3 Geology

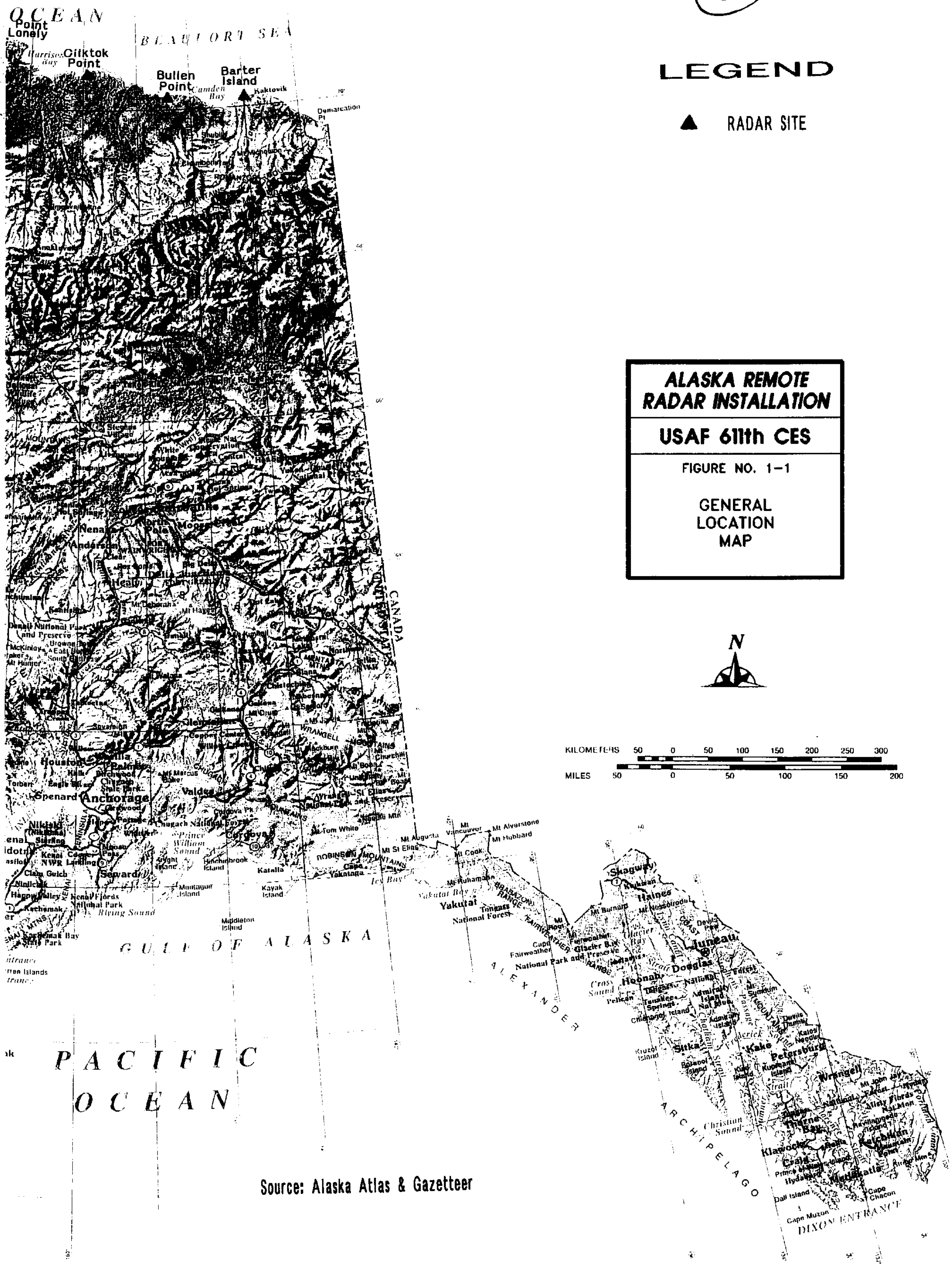
This section presents information on the regional and local geology of the Point Lay area.

1.2.3.1 Regional Geology. Geologic units of all the principal time-stratigraphic systems from Precambrian to Quaternary are represented in Alaska. For the last two or three million years, frost climates have prevailed in Alaska, and the geomorphic processes have been either periglacial or glacial (Wahrhaftig 1965). Although glacial activity was extensive, it was by no means all-encompassing. Glaciation is evident in many parts of the state including the Pacific Mountain System, Arctic Mountains, Ahklun Mountains, and southern Seaward Peninsula. Some great expanses, however, had no glacial activity. The principal areas not glaciated include the

1


ARCTIC OCEAN
Barrow
Point Barrow
Wainwright
Point Lonely
Cilktok Point
Point Lay
Cape Lisburne
Point Hope
CHUKCHI SEA
Alaska Maritime National Wildlife Refuge
Kivalina
Cape Krusenstern National Monument
RUSSIA
UNITED STATES
Kotzebue
KOTZEBUE SOUND
Shishmaref
Big Diomede Island
Little Diomede Island
Wales
BERING
SEWARD PENINSULA
Teller
King Island
Nome
Gambell
Savoonga
SAINT LAWRENCE ISLAND
NORTON SOUND
Norton Bay
Unalakleet
Stebbins
Saint Michael
BERING SEA
Emmonak
Alakanuk
Mountain Village
Hooper Bay
Chevak
Yukon Delta National Wildlife Refuge
Mekoryuk
Nunivak Island
Bethel
Kipnuk
Quinhagak
KUSKOKWIM BAY
McGrath
Aniak
Togiak
Platinum
Dillingham
Naknek
King Salmon
Cape Newenham
Saint Paul
PRIBILOF ISLANDS
Saint George
Saint George Island
BRISTOL BAY
Pilot Point
Port Heiden
Chignik Bay
Perryville
Sand Point
King Cove
Cold Bay
Izembek National Wildlife Refuge
Unimak Island
Unimak Pass
Sanak Islands
Shumagin Islands
Semidi Islands
Kodiak
SHELIKOF STRAIT
Kodiak National Wildlife Refuge
Trinity Islands
Nenana
Anderson
Houston
Anchorage
Spenard
Kenai
Soldotna
Seward
Homer
Seldovia
Augustine Vol
Iliamna Lake
Denali National Park and Preserve
Mt McKinley
GULF
PACIFIC OCEAN

(2)



LEGEND

▲ RADAR SITE

ALASKA REMOTE RADAR INSTALLATION
USAF 611th CES
FIGURE NO. 1-1 GENERAL LOCATION MAP

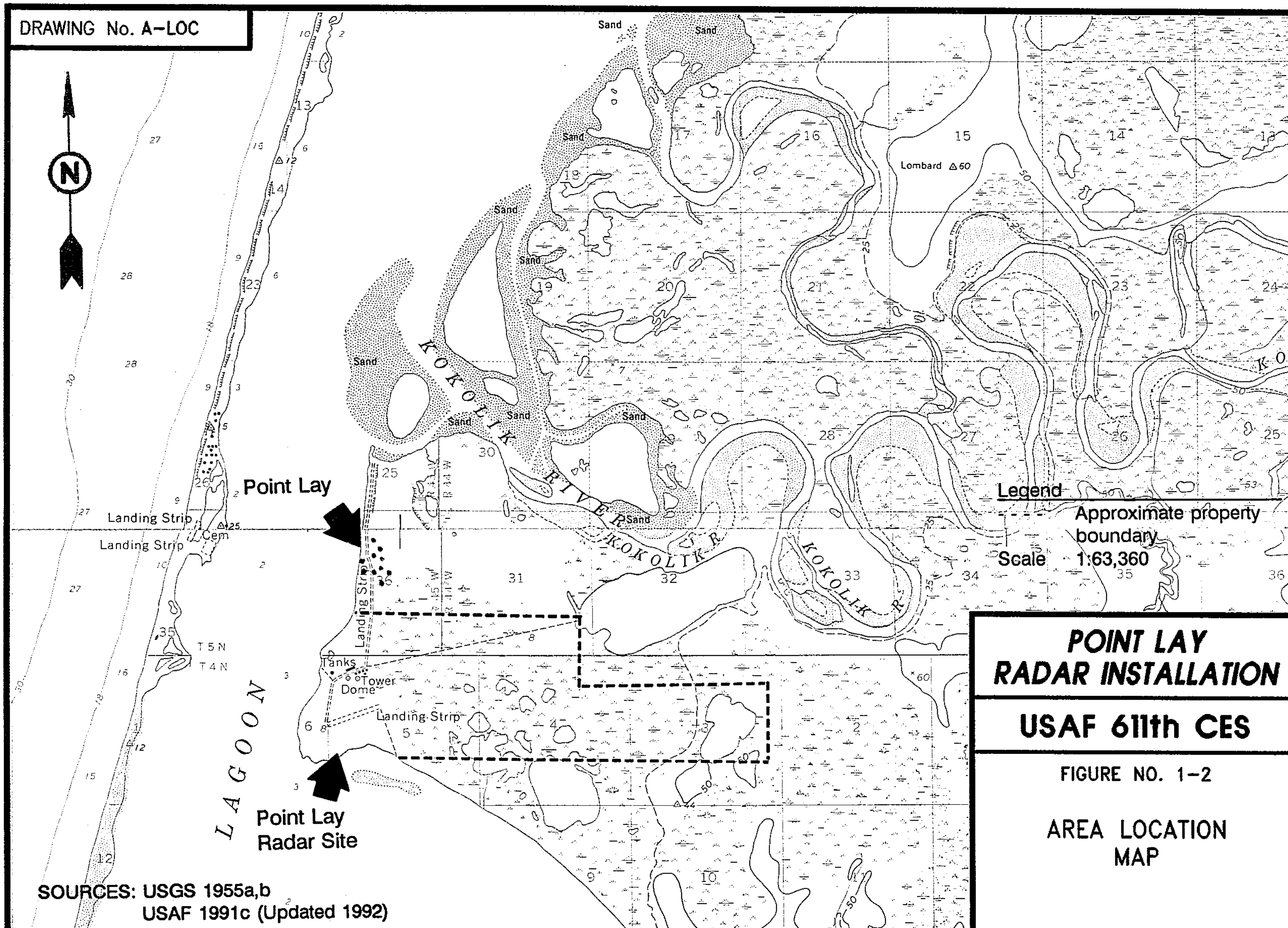
N

KILOMETERS 50 0 50 100 150 200 250 300

MILES 50 0 50 100 150 200

Source: Alaska Atlas & Gazetteer

DRAWING No. A-LOC



POINT LAY RADAR INSTALLATION

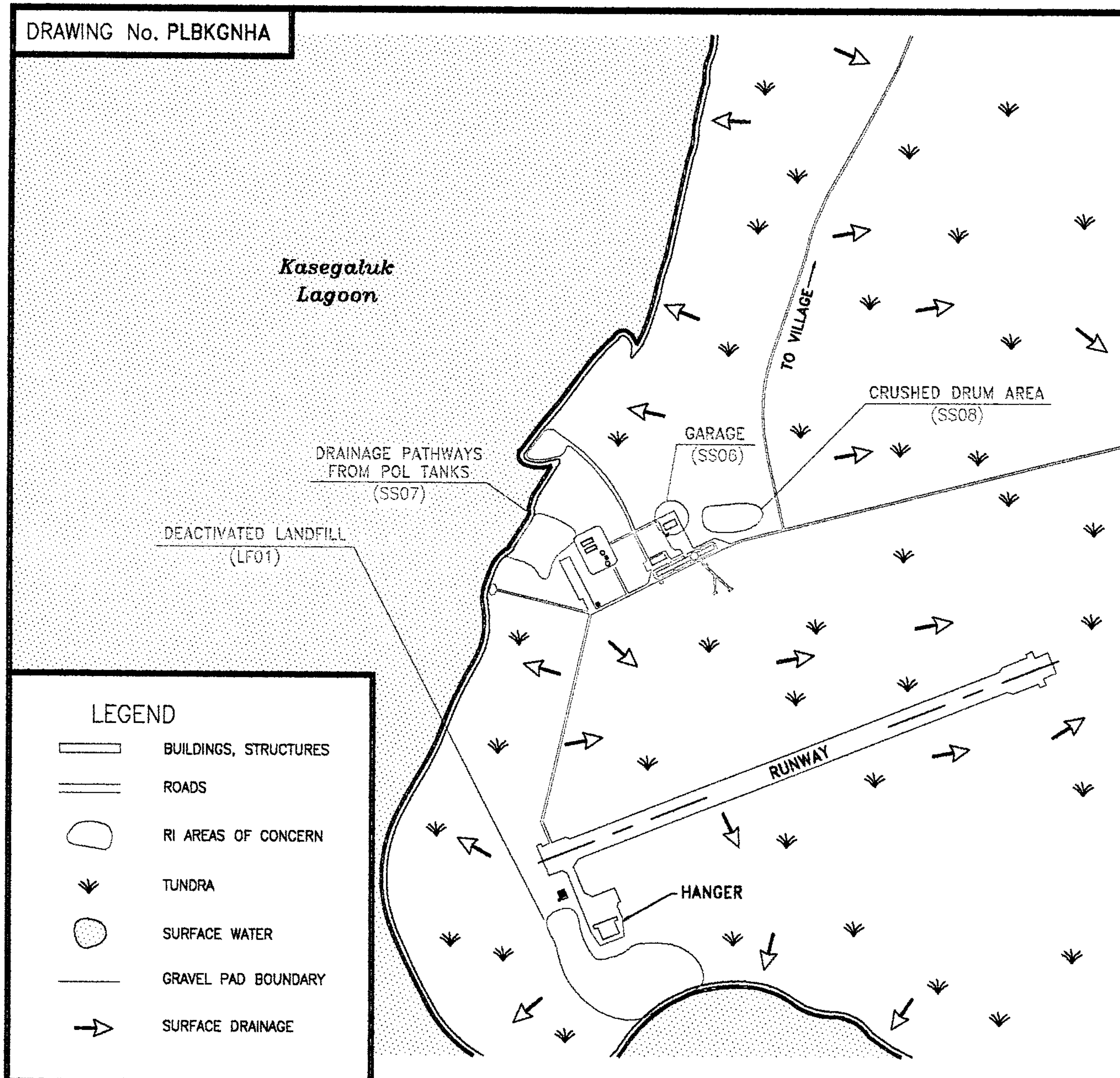
USAF 611th CES

FIGURE NO. 1-2

AREA LOCATION MAP

THIS PAGE INTENTIONALLY LEFT BLANK

DRAWING No. PLBKGNHA



POINT LAY
RADAR INSTALLATION

USAF 611th CES

FIGURE NO. 1–3

INSTALLATION
SITE PLAN

THIS PAGE INTENTIONALLY LEFT BLANK

Intermountain Plateaus, Arctic Foothills, and Arctic Coastal Plain. Many periglacial features such as polygonal ground, sorted circles, pingos, and ice wedges can be observed on the Arctic Coastal Plain. Figure 1-4 depicts the extent of Alaska's glacial areas.

Alaska's generally cold climate regime has produced permafrost, a combination of geologic, hydrologic, and meteorologic characteristics that produces permanently frozen ground. Permafrost occurs in both unconsolidated sediments and bedrock; its distribution includes most of the state with the notable exception of the Pacific Coastal area. Permafrost is continuous on the Arctic Coastal Plain and has a significant impact on the flow of ground and surface water. The distribution of Alaska's permafrost areas is shown on Figure 1-5. Permafrost is discussed in detail in Section 1.2.4.1.

The very strong geologic processes at work in Alaska have produced a unique environmental setting reflected in the general geology of the Arctic Region (Figure 1-6). A popular theory of the formation of the Arctic Region is that it was once an ocean basin adjacent to the Canadian Shield. Rifting of the Canadian Shield occurred during Mesozoic time, and the Arctic Region drifted southwest forming the Colville Basin to the south and the Arctic Ocean to the north. At the same time, the Brooks Range orogeny began creating a source for the newly-created Colville Basin. Continued uplift of the Brooks Range produced a prograding delta that filled in the Colville Basin.

1.2.3.2 Local Geology. The Point Lay facility is located on a low coastal bluff east of Kasegaluk Lagoon approximately eight feet above mean sea level (AMSL). The lagoon is formed by a thin barrier island system, located approximately one mile offshore, that roughly parallels the coast for approximately 120 miles.

The upper 12 to 18 inches of material in the vicinity of the installation consists of Holocene-age silty loam and an organic layer, called a tundra mat, that provides an insulating barrier between the air and the underlying perennially frozen ground. The area is underlain with shallow medium- to fine-grained sands and silts. As shown by the presence of numerous small lakes, and ponds, the silty loam is generally poorly drained. At the installation, the tundra mat and silts have been removed and gravel has been placed over the older sediments to provide a foundation for the existing DEW Line facilities.

There are no mineral deposits of economic value in the vicinity of the installation. The area is currently being explored for potential oil and gas deposits. The entire area is underlain by coal-bearing rocks, and small-scale mining occurs periodically in several areas south of the Point Lay installation where the coal crops out along the Kukpowruk River.

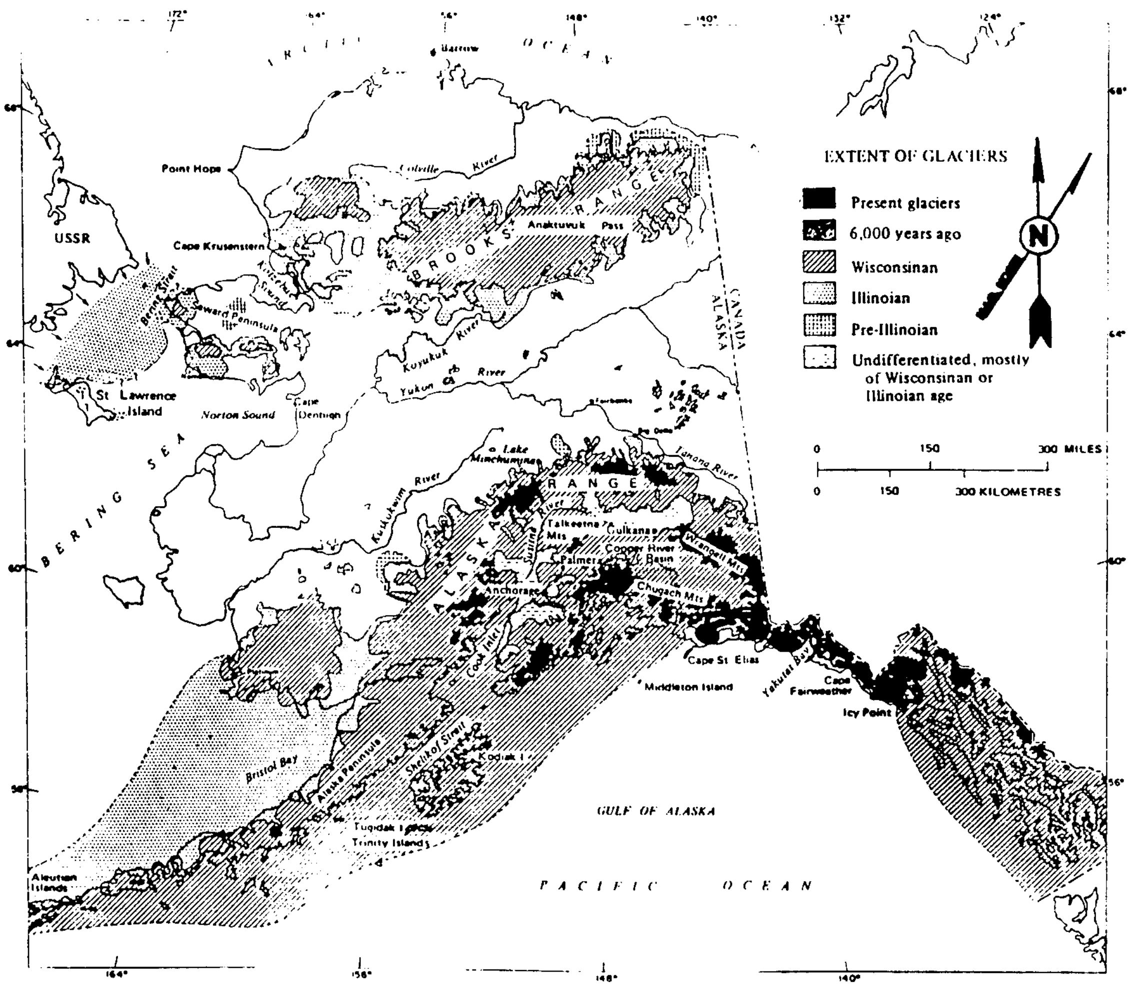
1.2.4 Hydrology

Ground water/permafrost and surface water are discussed in the following sections.

1.2.4.1 Ground Water/Permafrost. Permafrost has a profound influence on Alaska's ground water resources. Permafrost is defined by the *Glossary of Geology* (American Geological Institute 1972) as:

THIS PAGE INTENTIONALLY LEFT BLANK

DRAWING No. LIS1-4



SOURCE: Pewe 1975

ALASKA REMOTE RADAR INSTALLATIONS

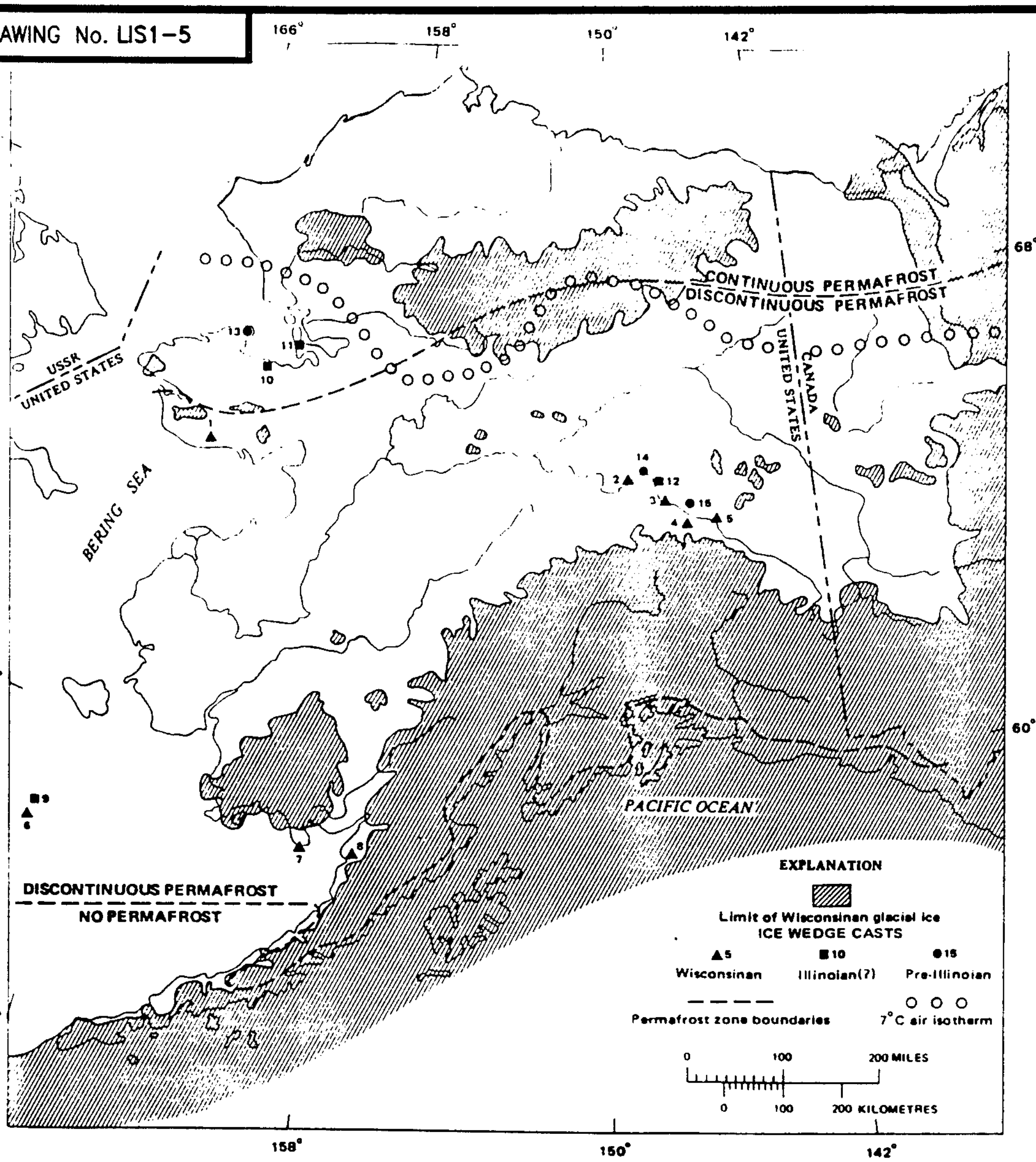
USAF 611th CES

FIGURE NO. 1-4

QUATERNARY GLACIATION IN ALASKA

THIS PAGE INTENTIONALLY LEFT BLANK

DRAWING No. LIS1-5



SOURCE: Pewe 1975

ALASKA REMOTE RADAR INSTALLATIONS

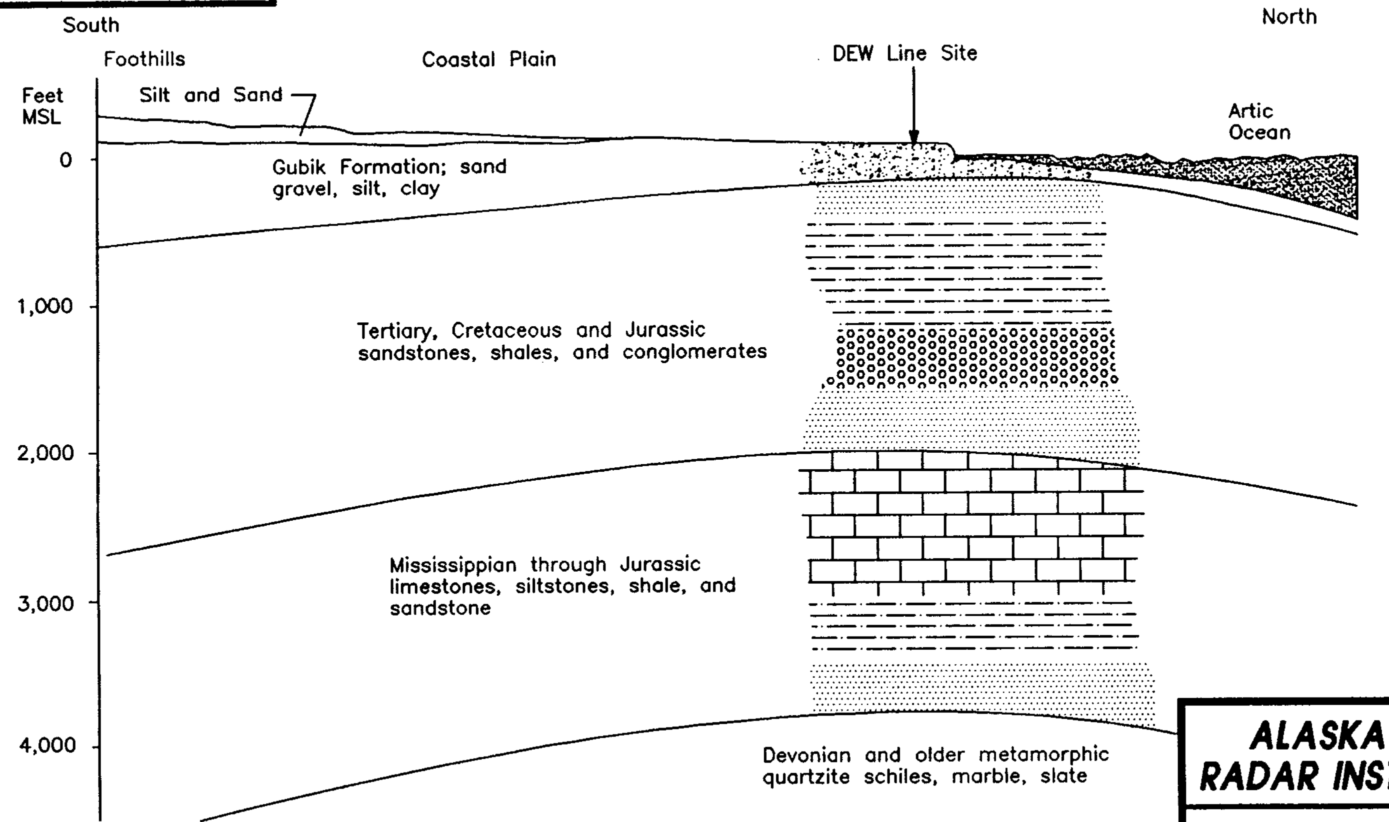
USAF 611th CES

FIGURE NO. 1-5

PERMAFROST MAP

THIS PAGE INTENTIONALLY LEFT BLANK

DRAWING No. LAY1-6



SOURCE: CH2M HILL 1981

Not to Scale

ALASKA REMOTE RADAR INSTALLATIONS

USAF 611th CES

FIGURE NO. 1-6

GENERALIZED NORTH-SOUTH GEOLOGIC CROSS SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

- Any soil, subsoil, or other surficial deposit, or even bedrock, occurring in arctic or subarctic regions at a variable depth beneath the earth's surface in which a temperature below freezing has existed continuously for a long time (from two years to thousands of years). This definition is based exclusively on temperature and disregards the texture, degree of compaction, water content, and lithologic character of the material.

Permafrost has a major impact on the relationship between surface water and ground water in cold regions such as Alaska. Although ground water in permafrost regions follows the same geologic and hydrologic principles as in temperate areas, the hydrologic regime is modified in the following ways:

- Permafrost acts as an impermeable barrier to the movement of ground water because pore spaces are ice-filled in the zone of saturation. Recharge and discharge are, therefore, limited to unfrozen channels penetrating the permafrost zone. The unfrozen channels are termed perforating taliks. Permafrost restricts the downward percolation of water and increases runoff, enhancing the creation of lakes and swamps (Feulner et al. 1971).

- Permafrost zones tend to reduce evapotranspiration. The generally low ground temperatures tend to reduce direct evaporation and transpiration (the escape of moisture through plant tissue into the air). Vegetation growth is enhanced near large surface water bodies where permafrost usually occurs at greater depth.

- Permafrost restricts an aquifer's storage capacity and the number of locations from which ground water may be withdrawn. Subpermafrost ground water occurs beneath the permafrost zone and is usually dependable. Suprapermafrost water occurs in the active zone, above the permafrost table, and tends to be seasonal; it freezes during the cold winter months.

- The ground water temperature varies from 32 to 40.1°F in permafrost regions because of the low ground temperatures (Williams 1970). Water tends to be more viscous in this temperature range and, therefore, moves slower than in temperate regions.

Low ground temperatures create the necessary environment for permafrost to form. The segment above the permafrost table is called the active zone, because it freezes and thaws with seasonal weather changes. The permafrost zone remains frozen year-round. The active zone is significant because suprapermafrost active zone water exists within it.

Ground water has been found in aquifers beneath the continuous permafrost, but little is known of these aquifer systems. Shallow ground water sources are also present in river gravel and in thaw bulbs beneath deep lakes. Active zone water is found during the summer months when this layer thaws, but the layer is relatively thin. The thickness of the active zone at Point Lay is estimated to range from one to six feet.

Surface features may have dramatic impacts on the subsurface distribution of permafrost because they influence heat transfer. Heat flow through surface water is greater than through land. Permafrost may be discontinuous or present at greater depth under and near large bodies of water such as rivers or deep lakes. Smaller bodies of water may affect the configuration of the permafrost surface or the total thickness of the permafrost at any given point. Figure 1-7 is a generalized representation of the relationship of surface features to the underlying permafrost.

1.2.4.2 Surface Water. At the Point Lay installation, surface drainage occurs as suprapermafrost sheet flow into Kasegaluk Lagoon or into the wet lowlands that surround the installation. There are no major streams that drain the installation. Surface water drainage features in the vicinity of the installation are presented in Figure 1-8. The area surrounding Point Lay contains three major rivers. The Kokolik River is approximately two miles directly north of the installation. The Epizetka and Kukpowruk rivers are six and eight miles south, respectively (Woodward-Clyde 1989).

Water in the lagoon and thaw lakes remains frozen from November to June. When the breakup of ice in the river occurs in July, there is a high potential for flooding due to the lack of relief and the blocking of streams by broken ice. The village of Point Lay has been moved several times because of flooding.

Most fresh water is obtained from deep lakes near the village. The Point Lay installation receives drinking water from a freshwater lake 1.5 miles to the east of the village. During winter, water is pumped from beneath ice that is six to eight feet thick.

1.2.5 Industrial Activities

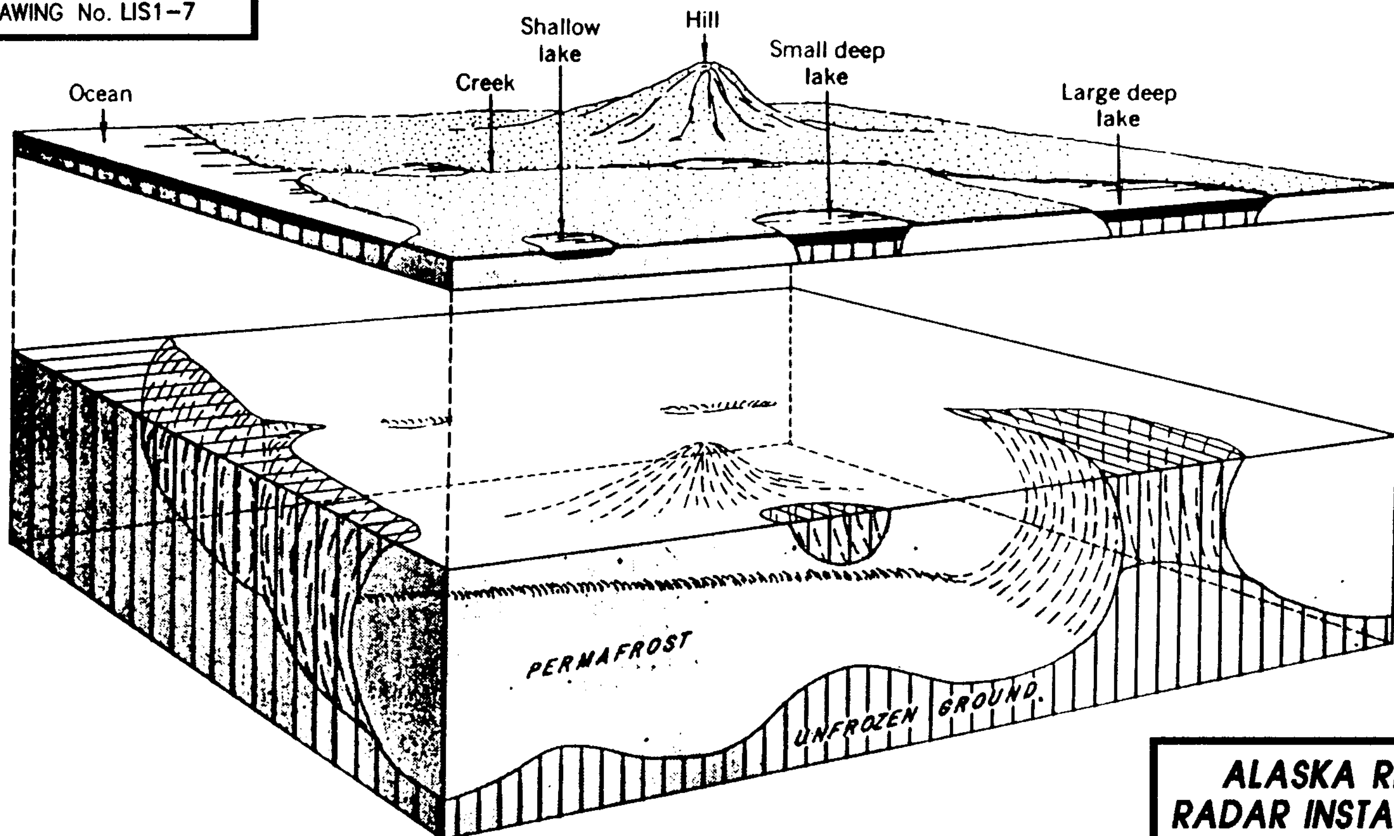
Primary industrial activities at the installation include operation and maintenance of the radar system. The Point Lay radar installation was built to support the air defense system in Alaska. The installation became operational in 1953 when communications were provided by high frequency radio. The original equipment still remains but was replaced with new Long Range Radar and satellite earth terminal systems, which are presently operational. Other industrial activities include maintenance associated with facility operation such as minor construction, road upkeep, and vehicle maintenance. Currently there are approximately four people stationed at the Point Lay installation.

Presently the installation consists of one 24-module train, rotating radar, and support facilities. The rotating radar is located in the radome, adjacent to the module train. The main section of the train houses the electric equipment work areas, a limited number or personnel quarters, administration offices, a mechanical room with emergency boiler and fuel storage, dining, kitchen, and recreation areas, water storage, showers, and toilets. There are also four communications dishes located southeast of the module train. Support facilities include a garage, warehouse, POL Tanks, and 3,519-foot long lighted gravel runway.

1.2.6 Biology

This section presents information on the regional fauna and flora of the Point Lay area.

DRAWING No. LIS1-7



SOURCE: Selkregg 1975

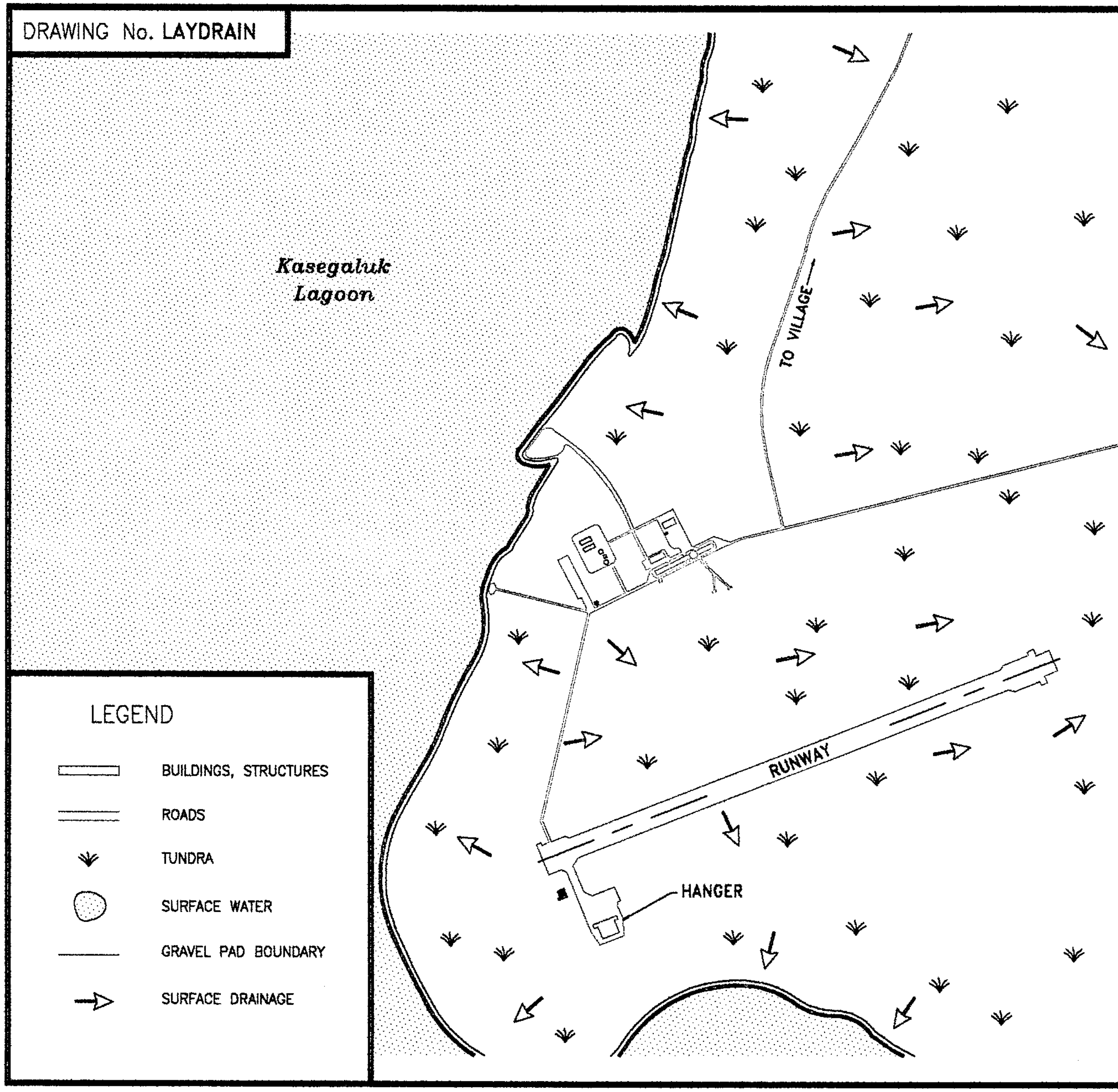
ALASKA REMOTE RADAR INSTALLATIONS

USAF 611th CES

FIGURE NO. 1-7

SURFACE FEATURE IMPACTS ON PERMAFROST DISTRIBUTION

THIS PAGE INTENTIONALLY LEFT BLANK



POINT LAY RADAR INSTALLATION

USAF 611th CES

FIGURE NO. 1-8

SURFACE WATER DRAINAGE FEATURES

THIS PAGE INTENTIONALLY LEFT BLANK

1.2.6.1 Vegetation. The vegetation at the Point Lay installation is characteristic of wet sedge meadows and tussock tundra. Mixtures of wetlands as described by Bergman et al. (1977) are also evident. The barrier islands support a marine zone vegetation type characterized by coarse grasses and succulent herbs (Koranda and Evans 1975).

The local habitats support a variety of grasses, *Dupontia* spp., *Arctophila* spp., *Poa* spp.; sedges, *Carex* spp.; rushes, *Juncus* spp.; cottongrass, *Eriophorum* spp.; saxifrage, *Saxifraga* spp.; and various mosses. Dwarf willows, *Salix* spp., are common in the vicinity, but their extent is limited. All vegetation is less than three feet high.

1.2.6.2 Fishes. The species associated with the aquatic habitats of the Kasegaluk Lagoon, and the Kukpowruk and Kokolik Rivers include salmon, *Oncorhynchus* spp.; smelt, *Osmerus* spp.; herring, *Clupea* spp.; arctic char, *Salvelinus alpinus*; grayling, *Thymallus arcticus*; whitefish and cisco, *Coregonus* spp.; and arctic flounder, *Liopsetta glacialis* (NPRA Task Force 1978). These habitats support significant spawning, rearing, and feeding activities.

1.2.6.3 Birds. The Kasegaluk Lagoon system is an excellent habitat for migratory and nesting waterfowl and shorebirds (Koranda and Evans 1975). Loons, *Gavia* spp.;arctic tern, *Sterna paradisaea*; jaegers, *Stercorarius* spp.; sandpipers, *Calidris* spp.; phalaropes, *Phalaropus* spp.; eiders, *Somateria* spp.; and brant, *Branta bernicla*, are species common to the area (Koranda and Evans 1975; NPRA Task Force 1978). Ptarmigan, *Lagopus* spp., are an important subsistence species, but the extent of local occurrence is unknown.

1.2.6.4 Mammals. Marine mammals that may frequent the area of Kasegaluk Lagoon include walrus, *Odobenus rosmarus*; bearded seals, *Erignathus barbatus*; spotted seals, *Phoca hispida*; polar bear, *Ursus maritimus*; and beluga, *Delphinapteras leucas* (Koranda and Evans 1975; NPRA Task Force 1978). Bowhead, *Balaena mysticetus*, and gray whales, *Eschrichtius robustus*, pass offshore during their migrations.

Terrestrial mammals representative of the wet tundra environments include shrews, *Sorex* spp.; brown lemming, *Lemmus trimucronatus*; microtine rodents, *Microtus* spp.; arctic fox, *Alopex lagopus*; and weasels, *Mustela* spp. Caribou, *Rangifer tarandus*, from the Western Arctic Herd pass through the area and are an important subsistence resource. Other terrestrial mammals important to subsistence include marmot, *Marmota caligata*; arctic ground squirrel; *Spermophilus parryii*; brown/grizzly bear, *Ursus arctos*; red fox, *Vulpes vulpes*; gray wolf, *Canis lupus*; and wolverine, *Gulo luscus* (NPRA Task Force 1978).

1.2.6.5 Threatened and Endangered Species. Threatened and endangered species potentially occurring in the vicinity of the Point Lay installation include spectacled eider, *Somateria fischeri* (threatened); Steller's eider, *Polysticta stelleri* (candidate for listing); and bowhead whale (endangered). According to surveys done by Alaska Biological Research (1994), neither the spectacled nor Steller's eider were found within the Point Lay installation boundaries, although there is potentially suitable habitat and a potential for nesting or brood-rearing in the vicinity of the installation. The bowhead whale may pass offshore of the installation during migration. The arctic peregrine falcon, *Falco peregrinus tundrius*, and gray whale, two previously listed species

with potential to occur near the installation, were delisted by the U.S. Fish and Wildlife Service, 5 October 1994, and by the National Marine Fisheries Service, 16 June 1994, respectively.

1.2.7 Demographics

An average of four personnel are stationed at the Point Lay facility. The village of Point Lay had an estimated population of 139 in 1990 (U.S. Bureau of the Census 1991). The community of Point Lay is one of the more recently established Inupiat villages on the arctic coast.

Air travel provides the only year-round access to the Point Lay area. Marine transport is available during the ice-free period of about mid-July to September or October. There are no roads linking the community of Point Lay or the DEW Line station to other communities on the North Slope. Overland travel is difficult in the summer, but during the winter snowmobiles and all-terrain vehicles (ATVs) are used to travel over the frozen tundra.

1.2.7.1 Local Economy. Subsistence is a way of life for many of the people in Point Lay; however, the area within the installation boundary is not used for subsistence purposes because of restricted status. For the most part, the population of Point Lay consists of young Eskimos. The few non-Eskimo residents have either assimilated into the community's lifestyle or were attracted to the community by borough service employment such as jobs with the school district. The population of Point Lay has increased 54 percent since the relocation of the village to its present site; almost 90 percent of the village residents in 1982 were Alaska Natives (Alaska Consultants, Inc. 1983).

Economic opportunities are limited because of the relative isolation at Point Lay. Contract construction work related directly to North Slope borough capital improvement projects accounted for 57 percent of all jobs in Point Lay. Government provided 34.5 percent of the employment in Point Lay, almost all of which was in borough-related school and utility operations. The only private sector jobs in Point Lay were three jobs in the Point Lay community store and three jobs associated with the borough construction camp (Hart Crowser 1987). No Point Lay residents are presently employed at the installation, but some residents have been employed there in the past.

1.2.7.2 Cultural Resources. Cultural resources identified in the area are listed in Table 1-1. All of the known cultural resource sites are of traditional importance. These sites have not been evaluated for listing in the National Register of Historic Places. No prehistoric sites in the vicinity of Point Lay are listed in the site files of the Alaska Heritage Resources Survey. However, systematic cultural resource surveys have not been conducted in this area.

One historic site, the remains of an undated house (TLUI Site 26) and possible burial site, was disturbed during construction of the Point Lay DEW Line station in the 1950s. The current condition of the site is unknown.

TABLE 1-1. KNOWN CULTURAL RESOURCE SITES IN THE VICINITY OF POINT LAY RADAR INSTALLATION[a]

SITE NAME	TLUI #[b] AHRS #	DESCRIPTION	LOCATION
Kayuqtualuk	22 --	Mythological significance; no visible remains.	Point Lay area.
Kali	24 --	Mound associated with local mythology; 1920s graveyard present.	Immediate vicinity of Point Lay, to the southwest.
None	26 --	Remnants of undated house structure and possible burials, reportedly disturbed during Point Lay construction.	Kokolik River, approximately 1.5 miles northeast of Point Lay.
Point Lay	-- XPL-053	Village site abandoned in 1953 with school closure; extant buildings, occupied during summer months.	On Barrier Island, approximately 2 miles northwest of Point Lay.
Niaquq or Singigruaq	11 --	Ancestral home of some Point Lay residents.	15 miles south of Point Lay.

a Data from Schneider and Bennett (1979); Alaska Division of Geological and Geophysical Survey Records (1984).

b TLUI = Traditional Land Use Inventory.
AHRS = Alaska Heritage Resources Survey.
Source: Hart Crowser 1987

1.2.7.3 Recreation. Little recreational use is made of this area because of limited access and the lack of accommodations and facilities. Limited hunting and fishing takes place; these activities are mostly subsistence-oriented and are not considered recreation. Local residents engage in snowmobiling and dog sled races, but most recreation is conducted indoors, with the school in Point Lay serving as the hub for recreational activities, and providing space for such activities as bingo or movies (Alaska Consultants, Inc. 1983).

1.3 SITE INVENTORY

This section presents information on the IRP sites at the Point Lay radar installation. It includes summaries of previous IRP activities and remedial actions that have been conducted at the installation.

1.3.1 Sites at Point Lay

Four sites at the Point Lay radar installation were investigated during the 1993 RI activities. One site, the Deactivated Landfill (LF01) was determined to be of concern based on previous IRP sampling data. Additionally, there were three sites identified for investigation based on previous IRP activities and the 1993 RI activities: literature search, pre-survey and reconnaissance trips, communication with personnel from Alaska Department of Environmental conservation (ADEC), and information on disposal practices at DEW Line stations. The additional sites include the Garage (SS06), Drainage Pathway from POL Tanks (SS07), and Crushed Drum Area (SS08). Prior to this RI/FS, no sampling had been conducted at these three sites.

It should be noted that none of the four sites is on, or is proposed to be included on, the national priority list (NPL) of Superfund sites.

1.3.2 Previous IRP Activities

An Air Force contractor conducted Phase I Installation Assessment/Records Search activities at the Point Lay radar installation and six other DEW Line stations in 1980 and 1981 (CH2M Hill 1981). Phase I activities included a detailed review of pertinent installation records from both government and civilian contractors, contacts with various government and private agencies for documents relevant to the program, and onsite visits during July and August 1981. The onsite visits included interviews with key station employees, ground tours of station facilities, and plane overflights to identify past disposal and possible contaminated areas.

Stages 1 and 2 of the Phase II Confirmation/Quantification activities were conducted in 1986 (Dames and Moore 1986, 1987). Phase II, Stage 1 activities involved field investigations of specific sites that were identified in the Phase I Installation Assessment/Records Search activities. Surface water samples were collected at three sites at the Point Lay installation.

A Technical Operations Plan for the Phase II, Stage 2 work was prepared in August 1986 (Dames and Moore 1986). Phase II, Stage 2 activities involved field investigation of three sites. Five water samples were collected. Onsite observations and analytical results were recorded in the Phase II, Stage 2 Draft Report (Dames and Moore 1987).

A private contractor prepared the Environmental Assessment for the North Warning System (Alaska), in January 1987 (Hart Crowser 1987). The report discussed the impacts of retrofitting with Long Lange Radar equipment at the Point Lay DEW Line facility.

An Air Force contractor released the final Technical Support Document for Record of Decision, LIZ-2 DEW Line site, in 1987 (Woodward-Clyde 1989). The Record of Decision, applicable to five potential hazardous waste sites identified at the Point Lay installation, called for no further action with regard to investigation or cleanup, based on the assessment that there is no significant impact on human health or the environment from suspected or confirmed contamination at the installation. However, correspondence from ADEC personnel to Air Force personnel in November 1991 disagreed with the "no further action" conclusion, and stated that further investigation was

needed and corrective action appeared necessary because of improper waste disposal practices and other issues.

1.3.3 Previous Remedial Actions

Previous IRP investigations conducted at the Point Lay installation have not determined the need for remedial actions at any of the sites investigated. Therefore, no previous remedial actions have been conducted at the installation.

THIS PAGE INTENTIONALLY LEFT BLANK

2.0 PROJECT ACTIVITIES

This section of the report describes the project objectives and scope, the RI field program and methodology, the analytical programs, background sampling, and analytical results. In addition, data evaluation, risk estimate methodologies, potential migration pathways, and receptors are presented.

2.1 PROJECT OBJECTIVES AND SCOPE

The objectives of the Point Lay DEW Line radar installation RI/FS are to confirm the presence or absence of chemical contamination in the environment at the installation; define the extent and magnitude of confirmed chemical releases; gather adequate data to determine the magnitude of potential risks to human health and the environment; and gather adequate data to identify and select the appropriate remedial actions for sites where apparent risks exceed acceptable limits or contamination exceeds regulatory guidelines. The project objectives include the following goals:

- Define the horizontal and vertical extent of soil contamination and the range of contaminant concentration;
- Determine the physical and chemical properties of soil contaminants to describe contaminant toxicity and mobility;
- Define the extent of surface and active zone water contamination and the range of contaminant concentrations;
- Describe real and potential surface and subsurface contaminant migration pathways in terms of movement of dissolved and suspended contaminants through the active zone above permafrost, and movement of dissolved and suspended contaminants in surface water;
- Generate adequate valid data to support development of a baseline risk assessment that quantifies, to the extent possible, potential risks to human health and the environment posed by chemicals of concern (COCs) at the Point Lay DEW Line installation studied under this RI; and
- Select the most feasible remedy, cleanup action, to reduce risks at sites where risks exceed acceptable limits.

2.2 RI FIELD ACTIVITIES

This section presents a summary of the field activities conducted during the RI, the organization of the RI field team, and the chronology of field work.

2.2.1 RI Field Program

The RI field program at the Point Lay radar installation was carried out in accordance with the RI/FS Work Plan, the SAP, and the Health and Safety Plan (U.S. Air Force 1993a,b,c). These RI/FS planning documents were developed as specified in the Delivery Order No. 22 Statement of Work (Appendix C) and IRP Handbook (U.S. Air Force 1991a).

The scope of the field investigation was described in detail in the Field Sampling Plan (U.S. Air Force 1993b). The field activities included the following:

- Collecting and analyzing surface and subsurface soil samples and sediment samples from sites with potential or confirmed contamination. These samples were described and analyzed for petroleum and other chemical residues. Samples were collected using hand tools.

- Collecting and analyzing samples of surface water from potentially affected streams, surface water features such as lakes or ponds, and any apparent leachate discharge points.

- Collecting and analyzing background soil, sediment, and surface water samples to characterize natural background conditions.

- Measuring relative surface elevations of sampling points and stream channels to determine surface slopes and stream gradients.

- Collecting samples of potential chemical residues and waste materials at sites where such materials were suspected and had not yet been characterized.

- Conducting real-time air monitoring using portable field instruments.

- Measuring surface distances and approximate elevations to locate sampling points relative to fixed reference points.

The RI activities described above were carried out in three phases as follows:

- Installation Pre-Survey. The pre-survey was conducted by a small group of contractor employees (four total) accompanied by Air Force representatives. The purpose of the pre-survey was to confirm the location of areas of environmental concern at the installation. Pre-survey activities were limited to visual inspection of the sites, surface distance measurements, site photography, and confirmation of the location of structures and sites as shown on installation plan maps. The information gathered from the pre-survey was combined with existing documentation to support development of the RI/FS scoping documents. The pre-survey was completed at the Point Lay installation on 14 May 1993 by an Air Force contractor.

- Installation Reconnaissance. The installation reconnaissance was conducted by a group of contractor employees on 23 June 1993. The purpose of the reconnaissance was to identify sampling locations for investigation during the RI. The contractor staff made detailed observations of potentially contaminated areas and performed limited intrusive activities (e.g., digging shallow holes with a shovel to determine the apparent depth of contamination at areas of soil staining). Data gathered during the installation reconnaissance provided the basis for determining the sites to be sampled, the approximate number of samples and their locations, analyses for each sample, and equipment and supply needs for the RI.

- Remedial Investigation Field Activities. The RI field activities were conducted from mid-August through early September of 1993. The RI was conducted in conjunction with RIs at seven other radar installations located throughout northern Alaska. Fifteen contractor employees were stationed in Alaska for the duration of the RI. Intrusive sampling activities at the Point Lay radar installation included collection of surface and subsurface soil samples with hand tools (e.g., shovels, scoops, bucket augers) and collection of surface water, sediment, and seep samples from drainages adjacent to landfills and potentially contaminated areas. The RI activities also included operation of temporary northern Alaska (Barrow, Alaska) laboratory facilities operated by a subcontractor.

2.2.2 Field Team Organization and Subcontractors

The organization of the RI field team, the responsibilities of the RI team members, and subcontractors used during RI activities are presented in Figure 2-1 (Note: all Point Lay sampling was conducted by the "B" RI Field Sampling Team). The Air Force Center for Environmental Excellence (AFCEE) restoration team chiefs that managed and conducted oversight of the RI field activities included Mr. Marty Faile, Mr. Mike McGhee, and Mr. Samer Karmi.

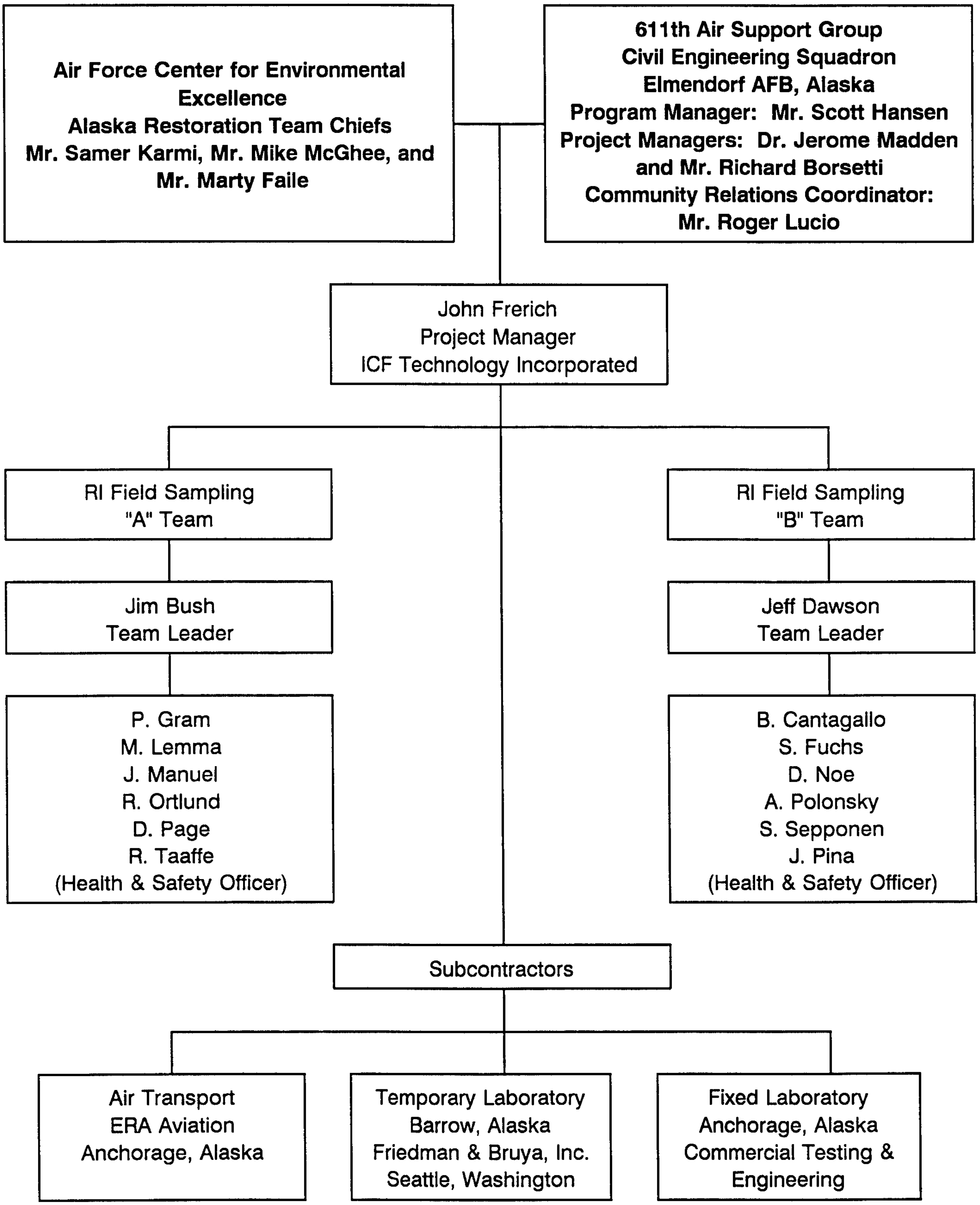
2.2.3 Chronology of Field Work

The RI field work at the Point Lay radar installation conducted during summer 1993 was accomplished in the following chronological order:

14 May	Conducted pre-survey
23 June	Conducted reconnaissance
22 August	Stockpiled RI sampling supplies at Point Lay radar installation. Staked out 52 sample locations at LF01, SS06, SS07, SS08, and background.
23 August	Staked out four sample locations at LF01. Collected nine soil samples at SS08, five soil and two water samples for background, and three quality assurance/quality control (QA/QC) samples.

THIS PAGE INTENTIONALLY LEFT BLANK

FIGURE 2-1. FIELD TEAM ORGANIZATION



THIS PAGE INTENTIONALLY LEFT BLANK

24 August	Staked out five sample locations at LF01 and SS06. Collected 10 soil and 7 water samples at LF01, 3 soil and 3 water samples at SS06, 3 soil and 3 water samples at SS07, 2 water samples at SS08, and 8 QA/QC samples.
07 September	Staked out 24 sample locations at LF01, SS06, SS07, and SS08. Collected three soil and two water samples at LF01, six soil samples at SS06, three soil and three water samples at SS07, five soil samples at SS08, and four QA/QC samples.
08 September	Demobilized equipment.

2.3 RI SAMPLING AND ANALYSES

A summary of the RI sampling and analysis activities conducted during this investigation is presented in this section. Included are descriptions of the number of samples collected by media, QA/QC samples collected, background sampling and analyses, analytical programs, chronology of laboratory analyses, laboratory QA/QC programs, and data validation and reporting.

2.3.1 Sampling Procedures

Contractor personnel collected samples from various media at the Point Lay radar installation using numerous sample collection methods and procedures. The collection methods were determined at the time of collection, based on sample location and prevailing environmental conditions. Media sampled during the RI included surface and subsurface soils, surface water, and sediment. These media were extracted generally from man-emplaced fill, gravel pads, and scraped areas; and natural tundra soils/sediments and surface water bodies. All sampling tools or other devices used during sampling were decontaminated before use. Standard procedures, developed by the contractor for sampling methodologies used during the RI are presented in Appendix D of the RI/FS SAP (U.S. Air Force 1993b). Sample collection logs for all samples collected during RI activities at the Point Lay installation are presented in Appendix D. The logs provide detailed sample information such as media, location, depth, and analyses requested. Completed chain-of-custody forms for all samples collected during the RI at the Point Lay installation are presented in Appendix E.

2.3.2 Summary of RI Sampling

Contractor personnel collected 97 samples from various media at the Point Lay radar installation. Seven samples were collected to determine organic and inorganic background concentrations in soil/sediment and surface water. Fifteen samples were collected for QA/QC. QA/QC samples included duplicates, replicates, equipment rinsate blanks, trip blanks, and ambient condition blanks. Seventy-five samples were collected to determine the nature and extent of contamination at the four sites at Point Lay. Table 2-1 presents a summary of RI sampling conducted at Point Lay.

TABLE 2-1. SUMMARY OF POINT LAY REMEDIAL INVESTIGATION FIELD SAMPLING ACTIVITIES

ACTIVITY	TOTAL
Water Samples Collected for Lab Analyses (includes QA/QC)	31 samples
Soil/sediment Samples Collected for Lab Analyses (including QA/QC)	66 samples
Drums of Investigation Derived Waste Generated (1 drum water)	0 sample[a]
TOTAL WATER AND SOIL SAMPLES FOR LAB ANALYSES	97 samples

a Investigation derived wastes (IDW) from Point Lay were combined with the IDW from Point Barrow, Point Lonely, and Wainwright. These were collectively sampled during the Point Barrow investigation.

2.3.2.1 Field QA/QC Samples. The field QA/QC program consisted of QA/QC samples, quality control (QC) checks, and limits for field procedures.

QA/QC Samples. QA/QC samples collected during this investigation included duplicate water samples, replicate soil/sediment samples, trip blanks, ambient condition blanks, and equipment rinsate blanks.

During RI sampling activities at the Point Lay installation, QA/QC samples collected included the following: two duplicate water samples, six replicate soil/sediment samples, three trip blanks, one ambient condition blank, and three equipment rinsate blanks. Table 2-2 summarizes all samples collected and analyzed during RI activities at the Point Lay installation, including the QA/QC samples.

In addition to the above QA/QC samples, extra volumes of selected samples were collected and submitted for internal laboratory QA/QC (matrix spike and matrix spike duplicates). Extra sample volumes were submitted at a minimum of 1 per 10 samples. Extra volumes submitted included triple volume for organic water analyses and double volume for inorganic water analyses.

2.3.2.2 Background Sampling and Analyses. Seven background samples were collected from upgradient areas during field activities at the Point Lay radar installation to establish background concentrations for naturally occurring organic compounds. In order to obtain a representative range of inorganic (metal) concentrations in soil/sediments and surface waters of the North Slope, 44 samples (29 soil/sediment and 15 water) from seven North Slope radar installations were collected. The seven installations include Barter Island, Bullen Point, Oliktok Point, Point Lonely, Point Barrow, Point Lay, and Wainwright. Approximately five soil/sediment and two surface water background samples were collected from each of these installations to determine the background concentrations of inorganic analytes across similar coastal arctic environments of the North Slope.

1

TABLE 2-2. SUMMARY OF SAMPLING AND ANALYSES CONDUCTED

ANALYSES	HVOC*	BTEX[b]	VOC 8260	SVOC	Metals	TPH-Diesel[b] Range 3510/3550	TPH - Gas Rang
ANALYTICAL METHOD	SW8010M	SW8020	SW8260	SW8270	SW3050 (Soil) 3005 (Water)/6010	Diesel 8100 M	Gas 5030/8
POINT LAY (LIZ-2)							
Background (BKGD)	5 Soil 2 Water	5 Soil 2 Water	5 Soil 2 Water	5 Soil 2 Water	5 Soil 2 Water (Total) 2 Water (Dissolved)	5 Soil 2 Water	5 Soi 2 Wat
Deactivated Landfill (LF01)	10 Soil 7 Water	10 Soil 7 Water	4 Soil 3 Water	1 Soil 1 Water	1 Soil 1 Water (Total) 1 Water (Dissolved)	13 Soil 9 Water	13 So 9 Wat
Garage (SS06)	13 Soil 2 Water	19 Soil 3 Water	4 Soil 1 Water	4 Soil 1 Water	2 Soil 1 Water (Total) 1 Water (Dissolved)	21 Soil 3 Water	21 So 3 Wat
Drainage Pathways from POL Tanks (SS07)	3 Water	4 Soil 3 Water	4 Soil 4 Water	1 Water	NA	7 Soil 6 Water	7 Soi 6 Wat
Crushed Drum Area (SS08)	9 Soil 2 Water	12 Soil 2 Water	4 Soil 1 Water	3 Soil 1 Water	2 Soil 1 Water (Total) 1 Water (Dissolved)	14 Soil 2 Water	14 So 2 Wat
Total Field Analyses	37 Soil 16 Water	50 Soil 17 Water	21 Soil 11 Water	13 Soil 6 Water	10 Soil 5 Water (Total) 5 Water (Dissolved)	60 Soil 22 Water	60 So 22 Wa
QA/QC SAMPLES							
Trip Blanks	2 Water	2 Water	3 Water	NA	NA	NA	2 Wat
Equipment Blanks	2 Water	2 Water	3 Water	2 Water	2 Water (Total) 1 Water (Dissolved)	2 Water	2 Wat
Ambient Condition Blanks	NA	NA	1 Water	NA	NA	NA	NA
Field Replicates	4 Soil	5 Soil	2 Soil	1 Soil	1 Soil	6 Soil	6 So
Field Duplicates	1 Water	2 Water	1 Water	1 Water	1 Water (Total) 1 Water (Dissolved)	2 Water	2 Wat
Total Site Analyses	41 Soil 21 Water	55 Soil 23 Water	23 Soil 19 Water	14 Soil 9 Water	11 Soil 8 Water (Total) 7 Water (Dissolved)	66 Soil 26 Water	66 So 28 Wa

NA Not analyzed.
* These analyses were completed on a quick turnaround basis.
a The number of soil sample includes sediment samples collected from surface water features.
b These analyses were completed on a 24-hour turnaround at a temporary fixed laboratory at Barrow, Alaska.
c Investigation derived wastes from Point Lay were combined with the investigation derived wastes from Point Ba

2

S CONDUCTED FOR POINT LAY REMEDIAL INVESTIGATIONS[a]

)iesel[b] ıge '3550	TPH - Gasoline[b] Range	TPH Residual Range*	PCB*	Pesticides*	TDS	TSS	TOC	TOTAL SAMPLES
3100 M	Gas 5030/8015M	Diesel 8100M	SW8080/8080M	SW8080/8080M	E160.1	E160.2	SW9060	
;oil ater	5 Soil 2 Water	5 Soil 2 Water	5 Soil 2 Water	5 Soil 2 Water	2 Water	2 Water	3 Soil 2 Water	5 Soil 2 Water
Soil 'ater	13 Soil 9 Water	10 Soil 7 Water	10 Soil 7 Water	1 Soil 1 Water	1 Water	1 Water	1 Soil 1 Water	13 Soil 9 Water
Soil 'ater	21 Soil 3 Water	13 Soil 3 Water	13 Soil	2 Soil	NA	NA	NA	21 Soil 3 Water
;oil ater	7 Soil 6 Water	4 Soil 3 Water	NA	1 Soil	1 Water	1 Water	1 Water	7 Soil 6 Water
Soil 'ater	14 Soil 2 Water	9 Soil 2 Water	9 Soil 2 Water	1 Soil	1 Water	1 Water	1 Water	14 Soil 2 Water
Soil /ater	60 Soil 22 Water	41 Soil 17 Water	37 Soil 11 Water	10 Soil 3 Water	5 Water	5 Water	4 Soil 5 Water	60 Soil 22 Water
A	2 Water	NA	NA	NA	NA	NA	NA	3 Water
'ater	2 Water	2 Water	2 Water	2 Water	NA	NA	NA	3 Water
A	NA	NA	NA	NA	NA	NA	NA	1 Water
;oil	6 Soil	4 Soil	4 Soil	2 Soil	NA	NA	1 Soil	6 Soil
'ater	2 Water	2 Water	1 Water	1 Water	1 Water	1 Water	1 Water	2 Water
Soil /ater	66 Soil 28 Water	45 Soil 21 Water	41 Soil 14 Water	12 Soil 6 Water	6 Water	6 Water	5 Soil 6 Water	66 Soil 31 Water

ırrow, Alaska.
ıtes from Point Barrow, Point Lonely, and Wainwright. These were collectively sampled during the Point Barrow investigation.

Seven background samples were collected from tundra and pond areas during the RI at Point Lay. These consisted of four soil, one sediment, and two surface water samples.

Four background soil samples were analyzed for diesel range petroleum hydrocarbons (DRPH), gasoline range petroleum hydrocarbons (GRPH), residual range petroleum hydrocarbons (RRPH), benzene, toluene, ethylbenzene, and xylene (BTEX), halogenated volatile organic compounds (HVOCs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and total metals. In addition, two samples were analyzed for total organic carbon (TOC).

One background sediment sample was analyzed for DRPH, GRPH, RRPH, BTEX, HVOCs, VOCs, SVOCs, pesticides, PCBs, total metals, and TOC.

Two background surface water samples were analyzed for DRPH, GRPH, RRPH, BTEX, HVOCs, VOCs, SVOCs, pesticides, PCBs, TOC, total suspended solids (TSS), total dissolved solids (TDS), and total and dissolved metals.

Data Summary. Background sample locations at Point Lay are illustrated in Figure 2-2. The data summary table (Table 2-3), presents analytical results for all background samples collected at Point Lay. Detection and quantitation limits, action levels, and the associated field and laboratory blank results are included on the data summary table.

Below is a discussion of organic compounds and inorganic analytes detected in background samples at Point Lay. A discussion of TDS, TSS, and TOC is included. Analytical results are presented in Table 2-3 and Figure 2-2.

Organics. No organic compounds were detected in background soil, sediment, or surface water samples. The ranges of background concentrations detected for all analytes are presented in data summary tables for each of the four sites presented in Section 3.0.

Inorganics. Sixteen metals were detected in background soil/sediment samples at Point Lay. The results of inorganic analyses are presented in Table 2-3. TOC was reported in three soil/sediment samples ranging from 57,000 to 69,300 mg/kg.

Eight metals were detected in background surface water samples collected at Point Lay. The results of inorganic analyses are presented in Table 2-3. TOC was reported at 40,000 and 31,700 μg/L in surface water samples BKGD-SW01 and BKGD-SW02, respectively. In the same two respective samples, TSS were reported at 6,000 and 77,000 μg/L, and TDS were reported at 149,000 and 151,000 μg/L.

2.3.3 Laboratory Analyses

This section describes the RI analytical program. Summaries of the soil/sediment and surface water analyses conducted during the RI are presented in Tables 2-4 and 2-5. Table 2-4 presents a description of the soil analytical methods and number of soil samples collected, and Table 2-5

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY

Installation: Point Lay
Site: Background (BKGD)

Matrix: Soil/Sediment
Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range	Environmental Samples					Field Blanks			Lab Blanks	
					S01	S02	S03	S04	SD01	AB01	EB01	TB01		
Laboratory Sample ID Numbers					433 4327-6	435 4327-7	437 4327-8	439 4327-9	431 4327-5	4356-5	443/446 4328-2	441 4328-1	#3&4-82493 #5-82593 4356 4328	#5-82193 #5-82493 #1&2-82493 #3&4-82793 4327
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	5-10	50-100	500[a]	<50[b]-<100[b]	<80[b]	<100[b]	<100[b]	<70[b]	<50[b]	NA	<1,000[b]	NA	<1,000	<50
GRPH	0.3-0.4	3-4	100	<3J[b]-<4J[b]	<3J[b]	<4J[b]	<4J[b]	<3J[b]	<3J[b]	NA	<50J[b]	<50J[b]	<100J	<2J
RRPH (Approx.)	10	100	2,000[a]	<100	<100	<100	<100	<100	<100	NA	<2,000	NA	<2,000	<100
BTEX (8020/ 8020 Mod.)			10 Total BTEX	<0.13-<0.20	<0.13	<0.20	<0.20	<0.18	<0.13					
Benzene	0.003-0.004	0.03-0.04	0.5	<0.02-<0.04	<0.02	<0.04	<0.04	<0.03	<0.03	<1[c]	<1	<1	<1	<0.02
Toluene	0.003-0.004	0.03-0.04		<0.02-<0.04	<0.02	<0.04	<0.04	<0.03	<0.03	<1[c]	<1	<1	<1	<0.02
Ethylbenzene	0.003-0.004	0.03-0.04		<0.03-<0.04	<0.03	<0.04	<0.04	<0.04	<0.03	<1[c]	<1	<1	<1	<0.02
Xylenes (Total)	0.004-0.008	0.04-0.08		<0.04-<0.08	<0.06	<0.08	<0.08	<0.08	<0.04	<2[c]	<2	<2	<2	<0.04
HVOC 8010	0.003-0.004	0.03-0.04		<0.03-<0.04	<0.03	<0.04	<0.04	<0.03	<0.03	NA	<1	<1	<1	<0.02J
VOC 8260	0.020	0.030-0.150		<0.03-<0.150	<0.150	<0.070	<0.040	<0.030	<0.050	<1-3.1	<1	<1-12	<1	<0.020
SVOC 8270	0.200	6.9-15.0		<6.90-<15	<10	<15.0	<12.0	<6.90	<13.0	NA	<36	NA	<10	<0.200
Pesticides	0.002-0.05	0.02-0.5		<0.02J-<0.5J	<0.02J-<0.5J	<0.02J-<0.5J	<0.02J-<0.5J	<0.02J-<0.5J	<0.02J-<0.5J	NA	<0.2J-<50J	NA	NA	<0.01
PCBs	0.01	0.1	10	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	NA	<2	NA	<10	<0.5
TOC				57,000-69,300	69,300	NA	NA	57,000	68,100	NA	NA	NA	<5,000	NA

□ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
a The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Background (BKGD)
Matrix: Soil/Sediment
Units: mg/kg
METALS ANALYSES

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Point Lay Bkgd. Range	Environmental Samples					Field Blank			Lab Blanks
						S01	S02	S03	S04	SD01		EB01		
Laboratory Sample ID Numbers						4327-6	4327-7	4327-8	4327-9	4327-5		4328-2		4328 4327
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		µg/L		µg/L
Aluminum	0.35	2		1,500-25,000	9,700-23,000	23,000	9,700	17,000	19,000	19,000		<100		<100
Antimony	N/A	66-115		<7.8-<230	<66-<115	<115J	<114	<79	<66	<85J		<100		<100
Arsenic	0.11	66-115		<4.9-8.5	<66-<115	<115	<114	<79	<66	<85		<100		<100
Barium	0.024	1		27-390	170-390	390	170	260	290	340		<50		<50
Beryllium	N/A	1-5.7		<2.6-6.4	<4.0-4.2	<5.7	<5.7	<4.0	4.2	<4.3		<50		<50
Cadmium	0.33	3.3-5.7		<3.0-<36	<3.3-<5.7	<5.7	<5.7	<4.0	<3.3	<4.3		<50		<50
Calcium	0.69	4		360-59,000	1,800-3,000	2,500	2,200	3,000	1,800	2,000		<200		<200
Chromium	0.066	1		<4.3-47	16-37	37	16	28	31	33		<50		<50
Cobalt	N/A	1-11		<5.1-12	<7.9-7.3	<11	<11	<7.9	7.3	<8.6		<100		<100
Copper	0.045	1		<2.7-45	15-25	20	15	19	19	25		<50		<50
Iron	0.50	2		5,400-35,000	13,900-35,000	35,000	13,900	21,000	30,100	33,000		<100		<100
Lead	0.13	2-11		<5.1-22	<11-20	20	<11	12	14	17		<100		<100
Magnesium	0.96	4		360-7,400	2,500-4,400	4,300	2,500	4,400	4,000	3,800		<200		<200
Manganese	0.025	1		25-290	73-110	97J	73	92	110	100J		<50		<50
Molybdenum	N/A	3.3-5.7		<2.5-<11	<3.3-<5.7	<5.7	<5.7	<4.0	<3.3	<4.3		<50		<50
Nickel	0.11	1		4.2-46	19-27	26	19	26	25	27		<50		<50
Potassium	23	100		<300-2,200	660-1,500	1,500	660	1,300	1,100	1,200		<5,000		<5,000

☐ CT&E Data.
N/A Not available.
J Result is an estimate.

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Background (BKGD)

Matrix: Soil/Sediment
Units: mg/kg

METALS ANALYSES

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Point Lay Bkgd. Range	Environmental Samples					Field Blank			Lab Blanks
						S01	S02	S03	S04	SD01		EB01		
Laboratory Sample ID Numbers						4327-6	4327-7	4327-8	4327-9	4327-5		4328-2		4328 4327
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		µg/L		µg/L
Selenium	1.2	66-115		<7.8-<170	<66-<115	<115	<114	<79	<66	<85		<100		<100
Silver	0.53	33-57		<3-<110	<33-<57	<57R	<57	<40	<33	<43R		<50J		<50
Sodium	0.55	5		<160-680	110-174	170	120	140	110	174		<250		<250
Thallium	0.011	0.31-0.57		<0.2-<1.2	<0.31-<0.57	<0.57	<0.55	<0.36	<0.31	<0.40		<5		<5
Vanadium	0.036	1		6.3-59	28-56	56	28	44	52	54		<50		<50
Zinc	0.16	1		9.2-95	26-48	46	26	48	44	48		<50		<50

☐ CT&E Data.
J Result is an estimate.
R Result has been rejected.

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Background (BKGD)
Matrix: Surface Water
Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range	Environmental Samples				Field Blanks			Lab Blanks
					SW01	SW02			AB01	EB01	TB01	
Laboratory Sample ID Numbers					448/457 4328-5 4329-1	461/462 4328-8 4329-4			4356-5	443/446 4328-2	441 4328-1	#5-82593 #3&4-82493 4356 4328 4329
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L	µg/L	µg/L	µg/L
DRPH	100	1,000		<1,000b	<1,000b	<1,000b			NA	<1,000b	NA	<1,000
GRPH	5	50		<50Jb	<50Jb	<50Jb			NA	<50Jb	<50Jb	<100J
RRPH (Approx.)	200	2,000		<2,000	<2,000	<2,000			NA	<2,000	NA	<2,000
BTEX (8020/8020 Mod.)												
Benzene	0.1	1	5	<1	<1	<1			<1c	<1	<1	<1
Toluene	0.1	1	1,000	<1	<1	<1			<1c	<1	<1	<1
Ethylbenzene	0.1	1	700	<1	<1	<1			<1c	<1	<1	<1
Xylenes (Total)	0.2	2	10,000	<2	<2	<2			<2c	<2	<2	<2
HVOC 8010	0.1	1		<1	<1	<1			NA	<1	<1	<1
VOC 8260	1	1		<1	<1	<1			<1-3.1	<1	<1-12	<1
SVOC 8270	10	20-31		<20-<31	<31	<20			NA	<36	NA	<10
Pesticides	0.2-5	2-50		<0.2J-<50J	<0.2J-<50J	<0.2J-<50J			NA	<0.2J-<50J	NA	NA
PCBs	0.2	2	0.5	<2	<2	<2			NA	<2	NA	<10

□ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Background (BKGD)

Matrix: Surface Water
Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range	Environmental Samples				Field Blanks			Lab Blanks
					SW01	SW02			AB01	EB01	TB01	
Laboratory Sample ID Numbers					448/457 4328-5 4329-1	461/462 4328-8 4329-4			4356-5	443/446 4328-2	441 4328-1	4356 4328 4329
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L	µg/L	µg/L	µg/L
TOC	5,000	5,000		31,700-40,000	40,000	31,700			NA	NA	NA	<5,000
TSS	100	200		6,000-77,000	6,000	77,000			NA	NA	NA	<100
TDS	10,000	10,000		149,000-151,000	149,000	151,000			NA	NA	NA	<10,000

☐ CT&E Data.
NA Not analyzed.

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Background (BKGD)

Matrix: Surface Water
Units: µg/L

METALS ANALYSES: TOTAL
(DISSOLVED)

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Point Lay Bkgd. Range	Environmental Samples					Field Blank			Lab Blanks
						SW01	SW02					EB01		
Laboratory Sample ID Numbers						4329-1 4328-5	4329-4 4328-8					4328-2		4329 4328
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L					µg/L		µg/L
Aluminum	17.4	100		<100-350 (<100-340)	130-350 (<100-340)	350 (340)	130 (<100)					<100		<100
Antimony	N/A	100	6	<100 (<100)	<100 (<100)	<100 (<100)	<100 (<100)					<100		<100
Arsenic	5.3	100	50	<100 (<100)	<100 (<100)	<100 (<100)	<100 (<100)					<100		<100
Barium	1.2	50	2,000	<50-93 (<50-91)	51-56 (<50)	51 (<50)	56 (<50)					<50		<50
Beryllium	N/A	50	4	<50 (<50)	<50 (<50)	<50 (<50)	<50 (<50)					<50		<50
Cadmium	1.7	50	5	<50 (<50)	<50 (<50)	<50 (<50)	<50 (<50)					<50		<50
Calcium	34.5	200		4,500-88,000 (4,100-86,000)	5,500-9,000 (5,300-8,600)	5,500 (5,300)	9,000 (8,600)					<200		<200
Chromium	3.29	50	100	<50 (<50)	<50 (<50)	<50 (<50)	<50 (<50)					<50		<50
Cobalt	N/A	100		<100 (<100)	<100 (<100)	<100 (<100)	<100 (<100)					<100		<100
Copper	2.3	50	1,300	<50 (<50)	<50 (<50)	<50 (<50)	<50 (<50)					<50		<50
Iron	25	100		180-2,800 (<100-1,600)	2,000-2,800 (950-1,600)	2,000 (1,600)	2,800 (950)					<100		<100

☐ CT&E Data.
N/A Not available.

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Background (BKGD)

Matrix: Surface Water
Units: $\mu g/L$

METALS ANALYSES: TOTAL
(DISSOLVED)

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Point Lay Bkgd. Range	Environmental Samples					Field Blank			Lab Blanks
						SW01	SW02					EB01		
Laboratory Sample ID Numbers						4329-1 4328-5	4329-4 4328-8					4328-2		4329 4328
ANALYSES	$\mu g/L$	$\mu g/L$	$\mu g/L$	$\mu g/L$	$\mu g/L$	$\mu g/L$	$\mu g/L$					$\mu g/L$		$\mu g/L$
Lead	6.6	100	15	<100 (<100)	<100 (<100)	<100 (<100)	<100 (<100)					<100		<100
Magnesium	47.8	200		<5,000-53,000 (2,600-54,000)	<5,000-5,500 (<4,900-5,500)	5,000 (4,900)	5,500 (5,500)					<200		<200
Manganese	1.24	50		<50-510 (<50-120)	120-510 (66-120)	120 (120)	510 (66)					<50		<50
Molybdenum	N/A	50		<50 (<50)	<50 (<50)	<50 (<50)	<50 (<50)					<50		<50
Nickel	5.5	50	100	<50 (<50)	<50 (<50)	<50 (<50)	<50 (<50)					<50		<50
Potassium	1,154	5,000		<5,000 (<5,000)	<5,000 (<5,000)	<5,000 (<5,000)	<5,000 (<5,000)					<5,000		<5,000
Selenium	62.4	100	50	<100 (<100)	<100 (<100)	<100 (<100)	<100 (<100)					<100		<100
Silver	2.6	50	50	<50 (<50)	<50 (<50)	<50J (<50)J	<50 (<50)					<50J		<50
Sodium	27.7	250		8,400-410,000 (8,200-450,000)	17,000-18,000 (17,000-19,000)	17,000 (17,000)	18,000 (19,000)					<250		<250
Thallium	0.57	5	2	<5 (<5)	<5 (<5)	<5 (<5)	<5 (<5)					<5		<5

☐ CT&E Data.
N/A Not available.
J Result is an estimate.

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Background (BKGD)

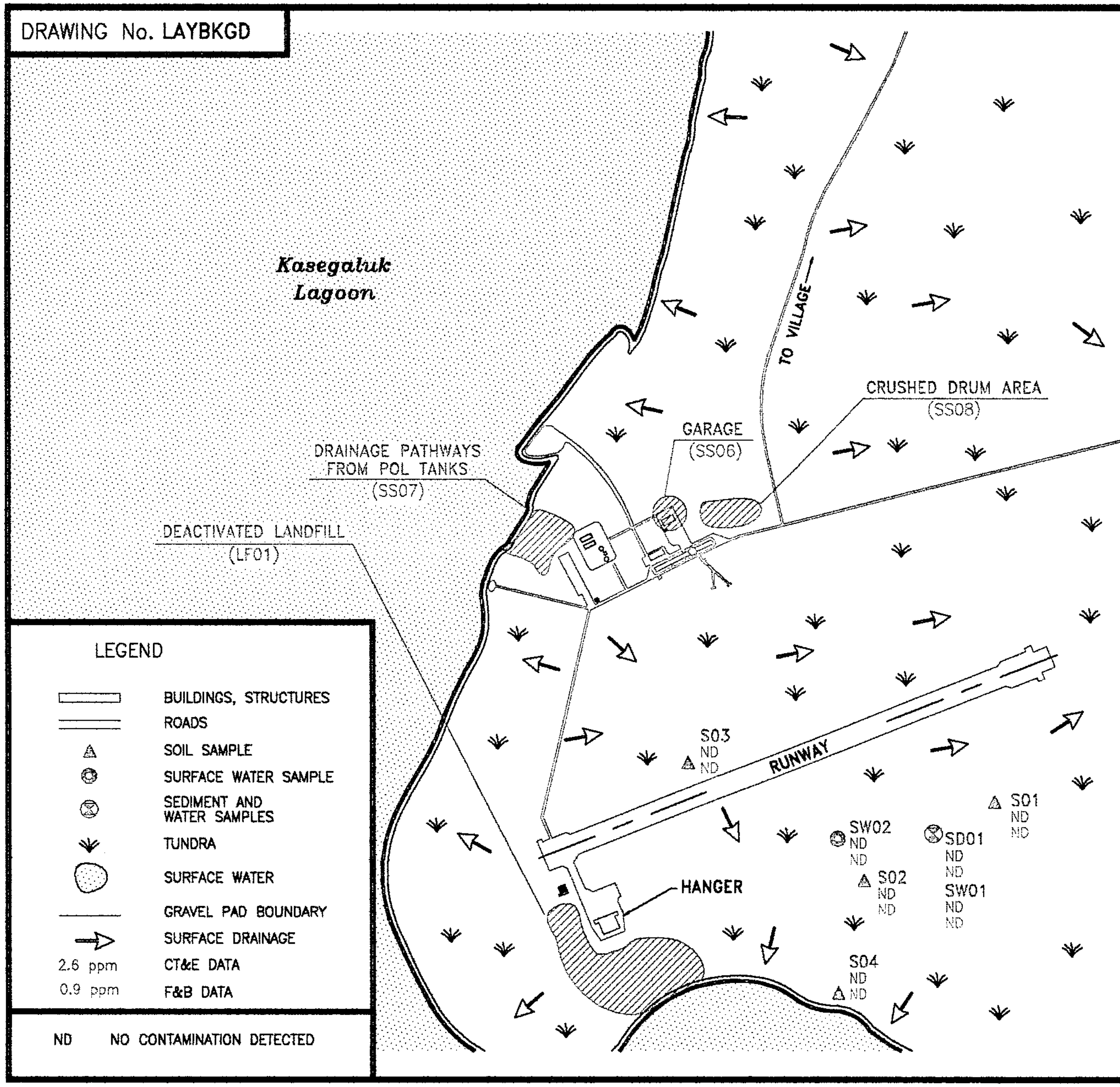
Matrix: Surface Water
Units: µg/L

METALS ANALYSES: TOTAL
(DISSOLVED)

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Point Lay Bkgd. Range	Environmental Samples					Field Blank			Lab Blanks
						SW01	SW02					EB01		
Laboratory Sample ID Numbers						4329-1 4328-5	4329-4 4328-8					4328-2		4329 4328
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L					µg/L		µg/L
Vanadium	1.8	50		<50 (<50)	<50 (<50)	<50 (<50)	<50 (<50)					<50		<50
Zinc	8.2	50		<50-160 (<50)	<50 (<50)	<50 (<50)	160 (<50)					<50		<50

☐ CT&E Data.

THIS PAGE INTENTIONALLY LEFT BLANK



POINT LAY RADAR INSTALLATION

USAF 611th CES

FIGURE NO. 2-2

BACKGROUND (BKGD) SAMPLE LOCATIONS AND ORGANIC ANALYTICAL RESULTS

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE 2-4. ANALYTICAL METHODS AND TOTAL NUMBER OF SOIL ANALYSES

SOIL ANALYSES[a]	ANALYTICAL METHOD	REPORTING UNITS	NUMBER OF ANALYSES	REPLICATES	TOTAL ANALYSES
VOC 8260	SW5030/8260	mg/kg	21	2	23
SVOC	SW3550/8270	mg/kg	13	1	14
Total Metals Analysis --ICP Screen	SW3050/6010	mg/kg	10	1	11
TOC, Soil	SW9060	mg/kg	4	1	5
TPH[b] - Diesel Range	SW3510/3550/8100M	mg/kg	60	6	66
TPH - Gasoline Range	SW5030/8015M	mg/kg	60	6	66
TPH - Residual Oil	SW3510/3550/8100M	mg/kg	41	4	45
BTEX	SW5030/8020/8020M	mg/kg	50	5	55
HVOC 8010M	SW5030/8010	mg/kg	37	4	41
PCB	SW5030/8080/8080M	mg/kg	37	4	41
Pesticides	SW5030/8080/8080M	mg/kg	10	2	12
TOTAL SOIL ANALYSES			343	36	379
TOTAL SOIL SAMPLES			60	6	66

M Modified.
a Includes soil and sediment analyses.
b TPH = Total Petroleum Hydrocarbon.

TABLE 2-5. ANALYTICAL METHODS AND TOTAL NUMBER OF WATER ANALYSES

WATER ANALYSES	ANALYTICAL METHOD	REPORTING UNITS	NUMBER OF ANALYSES	TRIP BLANKS	AMBIENT CONDITION BLANKS	EQUIPMENT BLANKS	DUPLICATES	TOTAL ANALYSES
VOC 8260	SW5030/8260	µg/L	11	3	1	3	1	19
SVOC	SW3550/8270	µg/L	6	0	0	2	1	9
Total Metals Analysis --ICP Screen	SW3005/6010	µg/L	5	0	0	2	1	8
Dissolved Metals Analysis --ICP Screen	SW3005/6010	µg/L	5	0	0	1	1	7
TOC, Nonpurgable	SW9060	µg/L	5	0	0	0	1	6
Residue, Filterable (TSS)	E 160.2	µg/L	5	0	0	0	1	6
Residue, Filterable (TDS)	E 160.1	µg/L	5	0	0	0	1	6
TPH - Diesel Range	SW3510/3550/8100M	µg/L	22	0	0	2	2	26
TPH - Gasoline Range	SW5030/8015M	µg/L	22	2	0	2	2	28
TPH - Residual Oil	SW3510/3550/8100M	µg/L	17	0	0	2	2	21
BTEX	SW5030/8020/8020M	µg/L	17	2	0	2	2	23
Halogenated Volatile Organic Compounds	SW5030/8010M	µg/L	16	2	0	2	1	21
PCB	SW5030/8080/8080M	µg/L	11	0	0	2	1	14
Pesticides	SW5030/8080/8080M	µg/L	3	0	0	2	1	6
TOTAL WATER ANALYSES			150	9	1	22	18	180
TOTAL WATER SAMPLES			22	3	1	3	2	31

presents a description of the water analytical methods and the number of surface water samples collected during the RI.

2.3.3.1 Analytical Program. Analyses of samples were conducted by a fixed laboratory in Anchorage, Alaska, and a temporary laboratory set up at Barrow, Alaska. The analytical testing conducted by each laboratory is discussed below.

The fixed laboratory in Anchorage, Alaska, was operated by Commercial Testing & Engineering (CT&E). CT&E analyzed samples as follows:

Analyses	Analytical Method
Volatile Organic Compounds	SW5030/8260
Metals	SW3050 (Soil) 3005 (Water)/6010
Semi-Volatile Organic Compounds	SW3550 (Soil) 3510 (Water)/8270
Total Dissolved Solids	E160.1
Total Suspended Solids	E160.5
Total Organic Carbon	SW9060
Moisture Content	ASTM D 2216
Toxicity Characteristic Leaching Procedure (TCLP)	SW1311

In addition, for the first few weeks of the field activities, CT&E provided the following analyses on a quick turnaround basis:

Analyses	Analytical Method
Halogenated Volatile Organic Compounds	SW5030/8010
Benzene, Toluene, Ethylbenzene, and Xylenes	SW5030/8020
Gasoline Range Petroleum Hydrocarbons	8015 Modified
Diesel Range Petroleum Hydrocarbons	8100 Modified
Polychlorinated Biphenyls/Pesticides	SW5030/8080

The temporary laboratory in Barrow, Alaska, was operated by Friedman & Bruya (F&B) of Seattle. F&B analyzed samples for the following constituents:

Analyses	Analytical Method
Halogenated Volatile Organic Compounds (four compounds only)	SW5030/8010 Modified
Benzene, Toluene, Ethylbenzene, and Xylenes	SW5030/8020 Modified
Polychlorinated Biphenyls/Pesticides	SW3550/8080 Modified
Diesel Range Organics (DRO)	8100 Modified
Gasoline Range Organics (GRO)	8010/8020/8015 Modified
Residual Range Organics	8100 Modified

Analytical methods used during sample analyses for this project are summarized in Tables 2-4 and 2-5 and are developed from the reference methods described in the following sources:

- *Test Methods for Evaluating Solid Waste (Physical/Chemical Methods)* Third Edition, EPA SW-846. September 1986.

- *Methods for Chemical Analysis of Water and Wastes*, EPA-600/4-79-020. March 1983.

- *Standard Methods for the Examination of Water and Wastewater,* APHA/AWWA, 17th Edition. 1989.

- *Interim Guidance for Non-UST Soil Cleanup Levels*, Alaska Department of Environmental Conservation. July 1991.

Project-specific analytical methods and procedures, target analytes, quantitation limits, and acceptance criteria are presented in the RI/FS SAP (U.S. Air Force 1993b).

2.3.4 Chronology of Laboratory Analyses

Laboratory analyses conducted by the temporary laboratory, F&B, in Barrow, Alaska, were conducted on a quick-turnaround basis. The samples collected at Point Lay radar installation were analyzed by this laboratory during the period from 24 August to 27 August 1993.

Analyses at the CT&E laboratory in Anchorage, Alaska, were conducted between 26 August and 26 October 1993. These analyses included a few quick-turnaround analyses and primarily standard-turnaround analyses.

2.3.5 Laboratory QA/QC Programs

The quality assurance (QA) objectives for this project were achieved through implementation of specific procedures for sampling, chain-of-custody, calibration, laboratory analyses, data validation and reporting, internal QC, audits, preventive maintenance, and corrective actions.

A detailed description of QA/QC measures, frequency, and corrective actions used by both labs is presented in the Quality Assurance Project Plan (QAPjP) [Section 1 of the RI/FS SAP (U.S. Air Force 1993b)]. Ultimately, the relevant laboratory standard operating procedures (SOPs) provide full and detailed guidance regarding all method-specific laboratory QA/QC criteria and appropriate corrective actions.

Data quality for the organic analyses was monitored by the laboratory through a QA program that included analyses of initial and continuing calibrations, method blanks, surrogate spikes, internal standards, matrix spikes, matrix spike duplicates, and laboratory control samples. The identification of target analytes at levels above the detection limit was confirmed by gas chromatography/mass spectrometry (GC/MS) or analysis on a gas chromatograph (GC) equipped with a different column (second column confirmation).

Data quality for the inorganic analyses was monitored through a QC program that included analyses of initial and continuing calibrations, laboratory control samples, method blanks, duplicate samples, post-digestion analytical spikes, and matrix spikes.

Laboratory QC samples were analyzed at a rate of at least one per 20 determinations. See the RI/FS QAPjP for laboratory-specific criteria for the frequency of QC sample analyses and corrective actions regarding QC analyses.

2.3.6 Data Validation and Reporting

Data validation is a systematic process of reviewing a group of sample data to provide assurance that the data are adequate for their intended use. The validation activities were performed in accordance with the following EPA documents to the extent that they were applicable:

- *Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses*. EPA. Hazardous Site Evaluation Division. December 1990.
- *Laboratory Data Validation Guidelines for Evaluating Inorganic Analyses*. EPA. Hazardous Site Evaluation Division. October 1989a.
- *Test Methods for Evaluating Solid Waste (Physical/Chemical Methods)* Third Edition, EPA SW-846. September 1986.

Prior to releasing data for use by project staff, selected data packages underwent a formal validation procedure to examine laboratory compliance with QA requirements and other factors that determine the quality of the data. The organic validation was performed by the prime contractor in accordance with the EPA Functional Guidelines for Evaluating Organic Analyses. The following factors were examined:

- Sample holding times;
- Sample chain-of-custody;
- GC/MS tuning criteria;
- Initial and continuing calibration;
- Method blanks;
- Practical quantitation limits;
- Laboratory blank contamination;
- Surrogate spike recoveries;
- Matrix spike/duplicate analysis;
- Field duplicate analysis;
- Ambient condition blank contamination;
- Trip blank contamination;
- Internal standard area;
- Pesticide instrument performance;
- Compound identification criteria; and
- Analyte identification and quantitation.

The inorganic data validation was performed in accordance with the EPA Functional Guidelines for Evaluating Inorganic Analyses. Parameters evaluated include:

- Holding time;
- Blank results;
- Instrument calibration;
- Inductively coupled plasma (ICP) spectroscopy interference check analysis;
- Laboratory control samples;
- Duplicate analysis;
- Spike analyses;
- Furnace analyses (spikes and duplicates);
- Serial dilution;
- Detection limits; and
- Analyte quantitation.

When a data package was received from the laboratory, the analytical results and associated QA/QC documentation were reviewed for technical compliance, and data validation reports were prepared summarizing the QA/QC parameters that were reviewed. The review included evaluation of laboratory and field blank sample data, and review of all data for accuracy, precision, and completeness.

A cross-section of CT&E analytical data, representing approximately 15 percent of all the CT&E analyses, underwent formal data validation. Because some reporting errors were found in the F&B analytical data, 100 percent of the F&B data was validated. Once the validation for a batch of samples was completed, a validation report was prepared. The report highlights all the QC criteria evaluated, and notes any major deficiencies or QA problems. Although a minimal amount of analytical data was rejected during data evaluation, the acceptable and valid data from CT&E and F&B are sufficient to meet the project objectives. The data validation reports for data generated by CT&E and F&B are presented in Appendix G.

2.4 METHODOLOGY FOR RISK ESTIMATION

This section describes the methods used to determine the potential risks to human and ecological receptors from chemicals detected in samples collected from the four sites at the installation. A summary of the risks posed by chemicals detected at each of the sites is presented on a site-by-site basis in Section 3.0. The complete human health and ecological risk assessments (ERAs) are presented in the Point Lay Risk Assessment (U.S. Air Force 1996), which has been submitted under separate cover.

In addition to the methods for risk evaluation, this section presents contaminant fate and transport, general potential migration pathways, and receptor groups common to all of the four Point Lay sites.

2.4.1 Human Health Risk

The evaluation of human health risk is conducted in accordance with standard risk assessment methodology as described in *Risk Assessment Guidance for Superfund (RAGS): Human Health Evaluation Manual, Part A* (EPA 1989a), *Region 10 Supplemental Risk Assessment Guidance for Superfund* (EPA 1991a), and the *Handbook to Support the Installation Restoration Program Statements of Work* (U.S. Air Force 1991a). This section presents a summary of the approach used in evaluating the human health risks associated with the sites at the Point Lay radar installation.

The Point Lay DEW Line installation presented a unique challenge to the development of a human health risk assessment. Many of the conventional assumptions applied to risk assessments do not apply to the North Slope of Alaska. Point Lay is remote and sparsely populated. Native residents from surrounding areas, largely Inupiats, follow a lifestyle that includes a significant subsistence component; much of their food consists of mammals (whales, seals, and caribou), aquatic life (arctic char), and birds (ptarmigan and ducks) that are abundant in this area of the arctic. The climate is generally harsh, and the soil and surface water are frozen for approximately nine months of the year. The following paragraphs present some of the approaches and assumptions used in the development of the human health risk assessment.

The general approach to the human health risk assessment was to quantify the excess lifetime cancer risk and the noncancer hazard associated with exposure to the site contaminants detected at each of the four sites at the installation. The maximum concentration of each chemical detected was used as the exposure point concentration instead of an arithmetic mean or 95th percentile upper confidence limit (UCL) because contamination was infrequently detected and found to be generally of low concentration. Incorporating nondetects into the calculation of an average or UCL when the frequency of positive detects is low tends to yield low and unreliable estimates of contamination. Use of the maximum concentration yields a more conservative estimate of risk or hazard.

Chemical concentrations detected in soil, sediment, or surface water samples from each of the sites were compared to risk-based screening levels (RBSLs), ARARS, and background concentrations. A chemical was selected as a COC if the maximum concentration at which the chemical was detected exceeded the corresponding background concentration, and the RBSL (based either on cancer risk or noncancer hazard) or an ARAR. In addiction, chemicals detected above background levels were retained as COCs if no RBSL or ARAR was available. COCs selected in this manner were evaluated in the human health risk assessment.

An exposure pathway describes the course a chemical will take from a source to an exposure point where a receptor can come into contact with the chemical. The exposure pathways by which exposure to the COCs at Point Lay may occur include ingestion, dermal contact, and inhalation. The dermal contact and inhalation pathways were not considered complete or significant because the arctic climate precludes dermal contact with and volatilization of site contaminants, so they were not evaluated. Exposure pathways that were considered for all sites were incidental ingestion of soil/sediment and ingestion of surface water.

Three potential receptor groups were evaluated in the risk assessment: an adult assigned to a DEW Line installation (worker), an adult inhabitant of a community on the North Slope of Alaska (native), and a child living in a North Slope community (child).

The risk assessment assumed a residential scenario when estimating the soil/sediment and water ingestion rates. The soil/sediment ingestion rate was based on EPA default values, 100 mg/day for adults and 200 mg/day for children. The drinking water ingestion rate assumed a potential future scenario where the surface water where chemicals were detected at the site will be used as a source of drinking water for 180 days per year at the EPA default ingestion rate of 2 liters per day.

The exposure duration assumed a DEW Line worker would be stationed at the Point Lay installation for 10 years. The exposure duration for the native was estimated to be 55 years. EPA's default reasonable maximum exposure duration is 30 years; however, this is based on the residence time in one location for the continental United States. Because Alaskan natives are more likely to remain in North Slope communities for a longer period, 55 years was determined to be a more appropriate estimate of residence time.

The risk assessment was based on the assumptions just described , along with chemical-specific toxicity data, to quantitatively and qualitatively express the hazards and risks. To characterize potential noncancerous effects, comparisons were made between projected intakes of the COCs and chemical-specific toxicity values. The potential noncancerous health effects were expressed as a hazard quotient (HQ). To assess the overall potential for noncancerous effects posed by more than one chemical at a site, the HQs were summed and reported as the hazard index. An HQ or hazard index of 1.0 is the regulatory benchmark. Noncancer hazards greater than 1.0 are generally considered a concern, and noncancer hazards of less than 1.0 are generally considered to not warrant further evaluation.

To characterize the potential for carcinogenic effects, the probability that an individual will develop cancer over a lifetime of exposure, the risks were estimated from projected intakes of the COCs and chemical-specific dose-response information. The cancer risks are calculated on a chemical-specific basis and are added together (if more than one chemical associated with cancer risk is a COC at the site) to estimate the total cancer risk for the site. The total cancer risk for each pathway is generally not considered to be of concern unless it exceeds a value of 1×10^{-6} (EPA 1991b).

Excess lifetime cancer risk is the incremental increase over and above the background (i.e., if no exposure to site chemicals occurs) in the probability of developing cancer during one's lifetime. For example, a 1×10^{-6} excess lifetime cancer risk means that, in a population of one million people exposed to the carcinogen throughout their lifetimes, the average incidence of cancer may increase by one case. The background probability among Americans of developing cancer at some time in their lives is about one in four (American Cancer Society 1993). The calculation of cancer risks uses information (i.e., cancer slope factors) developed by the EPA that represents upper bound estimates, so any cancer risks estimated in the risk assessment should be regarded as upper bounds on the potential cancer risks rather than accurate representations of true cancer risk. The true cancer risk is likely to be lower than that predicted (EPA 1989a).

Excess lifetime cancer risk and noncancer hazard were calculated for the soil/sediment ingestion and water ingestion pathways. Other pathways were eliminated from consideration as described in the Point Lay Risk Assessment (U.S. Air Force 1996). The risks and hazards associated with chemicals detected at the Point Lay sites are presented on a site-by-site basis in Section 3.0 of this RI/FS report.

2.4.2 Ecological Risk

The objective of the ERA is to estimate potential impacts to aquatic and terrestrial plants and animals at the Point Lay DEW Line installation. The evaluation of environmental risks was conducted in accordance with current Air Force and EPA guidance, specifically, *Handbook to Support the Installation Restoration Program Statements of Work* (U.S. Air Force 1991), *Framework for Ecological Risk Assessment* (EPA 1992), and *Ecological Risk Assessment Guidance for Superfund* (EPA 1994).

The approach used to assess potential ecological impacts was conceptually similar to that used to assess human health risks. Potentially exposed populations (receptors) were identified, and information on exposure and toxicity was combined to derive estimates of risk. However, the scope of ERAs is generally different from that of human health risk assessments in that ecological assessment focuses on potential impacts to a population of organisms rather than to individual organisms (except in the case of endangered species where individuals are considered). In addition, because ecosystems are composed of a variety of species, ecological assessments evaluate potential impacts to numerous species instead of a single species (as is the case in human health assessments).

Ideally, ERAs should evaluate potential risks to communities and ecosystems, as well as to individual populations. However, because of the large number of species and communities present in natural systems, such ecosystem-wide assessments are very complex and appropriate assessment methodologies have not yet been developed. In addition, dose-response data on community or ecosystem responses are generally lacking. Therefore, evaluations of potential impacts to communities or ecosystems are qualitative.

The degree to which potential ecological impacts can be characterized is highly dependent upon the data available to support such estimates. Data required include: information regarding contaminant release, transport, and fate; characteristics of potential receptor populations; and adequate supporting toxicity data for the COCs. The degree to which the existing database can meet these requirements dictates the extent to which potential ecological impacts can be evaluated.

Ecological receptors can be exposed to COCs through abiotic and biotic media. Potential exposure pathways for terrestrial and aquatic organisms include direct contact and ingestion of contaminated soil/sediment and/or surface water. The most significant route of exposure for plants is direct contact with soil. Aquatic organisms such as fish and invertebrates are primarily exposed through direct contact with surface water, but may be exposed to COCs through ingestion of plant and animal items in the diet, and incidental ingestion of soil/sediment while foraging (although only direct contact with surface water is used to develop risk estimates). Birds

and mammals may be exposed to COCs through ingestion of surface water, ingestion of plant and animal diet items, and incidental ingestion of soil/sediment.

The potential ecological receptors evaluated in the risk assessment include plants, aquatic organisms, birds, and mammals likely to occur along the Arctic Coastal Plain. Representative species from these groups of receptors were selected based primarily on the species' likelihood of exposure given their preferred habitat and feeding habits. Species that may be particularly sensitive to environmental impacts, such as endangered or threatened species, were also evaluated. The representative species are presented in Table 2-6. Any threatened or endangered species evaluated in the ERA are not considered representative of the Arctic Coastal Plain or the DEW Line installations. These species are evaluated to provide information about whether they face potential risks from exposure to COCs.

Potential risks to representative species were estimated by evaluating sampling data for the relevant exposure media (i.e., soil/sediment and surface water). Potential risks to plants were evaluated based on a comparison of the average contaminant concentrations in the site soil/sediment via toxicity information in the literature. Potential impacts on aquatic receptors were evaluated by comparing average surface water concentrations to toxicity reference values (TRVs). Potential impacts to birds and mammals were evaluated for selected representative species by comparisons of estimated exposures, based on potential dietary intakes of COCs, to TRVs. TRVs for representative species are derived by selecting toxicity values from the literature and extrapolating to the species of concern. TRVs are then divided into the estimated exposure concentration to derive the HQ. If the HQ is less than one, then adverse effects are not expected. Conversely, if the HQ is equal to or greater than one a potential for adverse effects exists. The confidence level of the risk estimate is increased as the magnitude of the HQ departs from 1.0. For example, there is greater confidence in a risk estimate where the HQ is 0.1 or 10, than in an HQ such as 0.9 to 1.1.

TRVs are calculated to be protective for long-term exposures. This is accomplished by using chronic chemical and receptor-specific no-effect dosages as starting points when such data is available. If chronic or receptor-specific data is not available, then uncertainty and scaling factors (to account for differences in body size) are incorporated in the derivation of the TRVs. This is standard practice in ERAs and is illustrated in screening level benchmarks used in the ERA for sediments (Hull and Suter 1994), aquatic biota (Suter and Mabrey 1994), and wildlife (Opresko et al. 1994). The assumptions incorporated in the ERA assume daily exposure during the receptor's most sensitive life stage (i.e., one breeding season). Consequently, if no risks are identified at the "chronic" level, there will be no risk related to "acute", or occasional exposures. This should be kept in mind when interpreting the HQ. Although the HQ may be greater than one, the conservatism embodied in the TRV, and assumptions of the ERA, allow for mitigating factors (e.g., large home range, short seasonal exposure, unlikely repeated exposures at a "hot spot" location) that may result in a finding of no significant risk.

The ERA was intended to be at a screening level, rather than a full scale investigation of the state of the ecosystem. No specific onsite studies of the biota were undertaken. The assessment was based on media sampling (i.e., surface water and soil/sediment samples). The ecological risks associated with the chemicals detected at the Point Lay sites are presented site-by-site in Section

TABLE 2-6. REPRESENTATIVE SPECIES AT THE DEW LINE INSTALLATION SITES

COMMON NAME	GENUS AND SPECIES
Sedge	*Carex* spp.
Cottongrass	*Eriophorum* spp.
Willow	*Salix* spp.
Berries	*Vaccinium* spp.
Water fleas	*Daphnia* spp.
Nine-spined stickleback	*Pungitius pungitius*
Arctic char	*Salvelinus alpinus*
Lapland longspur	*Calcarius lapponicus*
Brant	*Branta bernicla*
Glaucous gull	*Larus hyperboreus*
Pectoral sandpiper	*Calidris melanotos*
Brown lemming	*Lemmus trimucronatus*
Arctic fox	*Alopex lagopus*
Barren-ground caribou	*Rangifu tarndus*
Spectacled eider[a]	*Somateria fischeri*
Steller's eider[b]	*Polysticta stelleri*

a threatened status
b candidate for threatened status

3.0 of this RI/FS report. The complete ERA is presented in the Section 3.0 of the Final Point Lay Risk Assessment (U.S. Air Force 1996).

2.4.3 Contaminant Fate and Transport

The fate and transport of the COCs in soil/sediment, active layer water, and surface water have been accounted for in the sampling plan. Known source areas were sampled, and the extent of migration was evaluated by sampling at increasing distances from the source area. Surface and subsurface sampling was conducted in gravel pads and tundra areas to characterize the extent of contaminant migration. Groundwater was not evaluated because subsurface water flow occurs only in the active layer over the permafrost, and groundwater is not used for domestic purposes. Water samples were collected from streams and ponds and analyzed to evaluate the migration of contamination from source areas to water bodies potentially used by human or ecological receptors. The potential for contaminant migration is discussed on a site-specific basis in Section 3.0.

2.4.4 General Migration Pathways

This section presents general information concerning migration pathways for the four sites at the Point Lay radar installation. Site-specific migration pathways are discussed in Section 3.0.

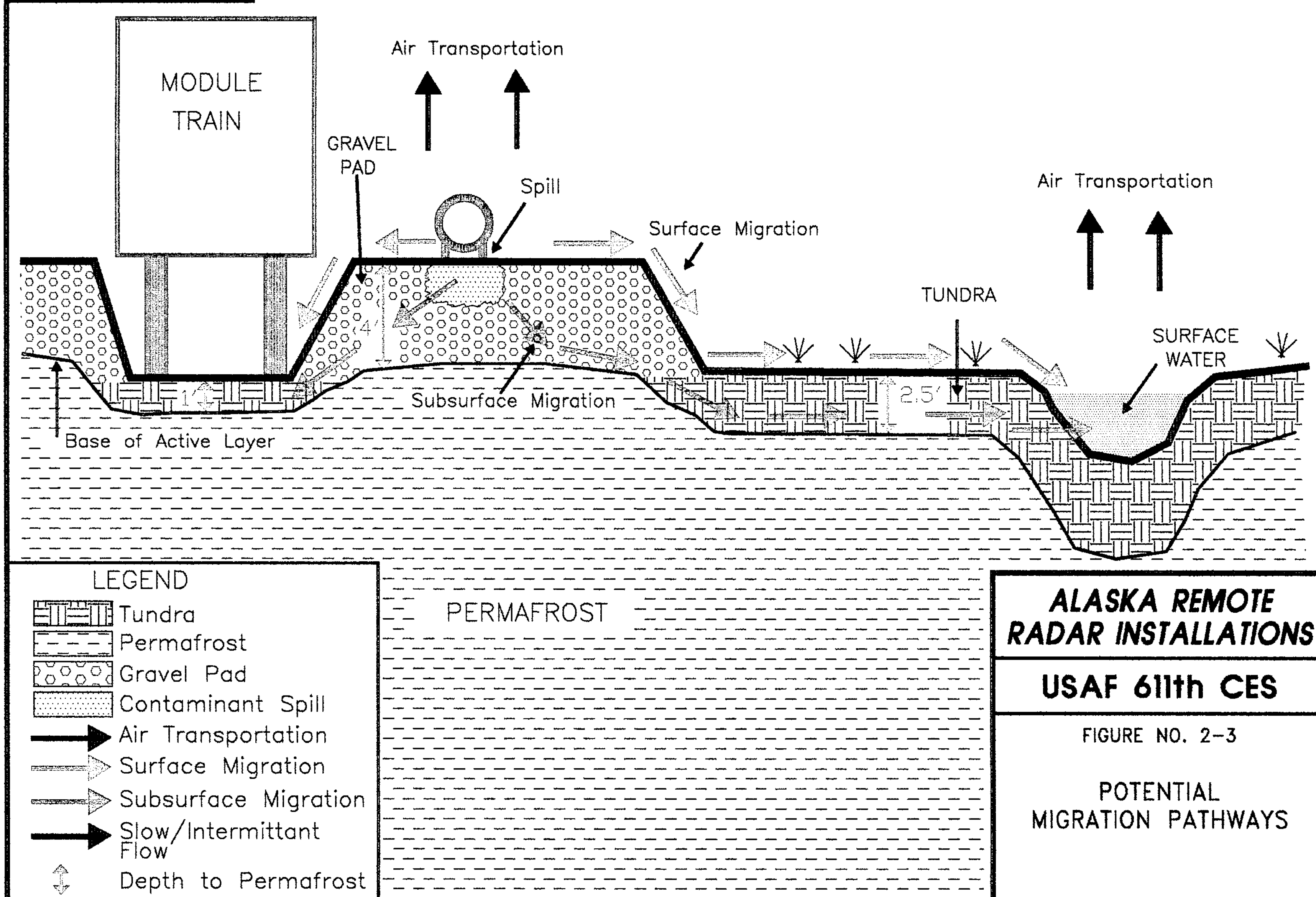
The potential for contaminant migration exists for any site where a release has occurred. The threat that a contaminated site presents to human health or the environment was assessed according to the potential for contaminant migration, human or ecological receptors, and contaminant concentrations to which the receptors may be exposed.

There are three main pathways through which contaminants may reach human and ecological receptors. These pathways are subsurface migration (in affected active layer water), surface migration, and air transportation (as vapors or dust). Potential migration pathways are depicted in Figure 2-3. Figures 2-4 and 2-5 present the potential exposure pathways for the human and ecological receptors, respectively. The discussion of migration pathways is preceded by a general description of the topography and stratigraphy at Point Lay.

2.4.4.1 Topography. The Point Lay installation is located on the west shore of Kasegaluk Lagoon, approximately 1.25 miles south of the Kokolik River. The installation is situated south of the village of Point Lay, which is located midway between most station facilities and the Kokolik River. Although the Point Lay installation encompasses 1,442 acres of terrain, most installation facilities are clustered adjacent to the module train in the western portion of the installation acreage.

The average elevation at the Point Lay installation is approximately eight feet AMSL. The surrounding topography is very flat, except near the shore of Kasegaluk Lagoon, where there is an approximately eight foot beach bluff. Drainage at the site consists of small, marshy streams and drainage ditches, with the streams becoming better defined and slightly incised near the

DRAWING No. AK2-3



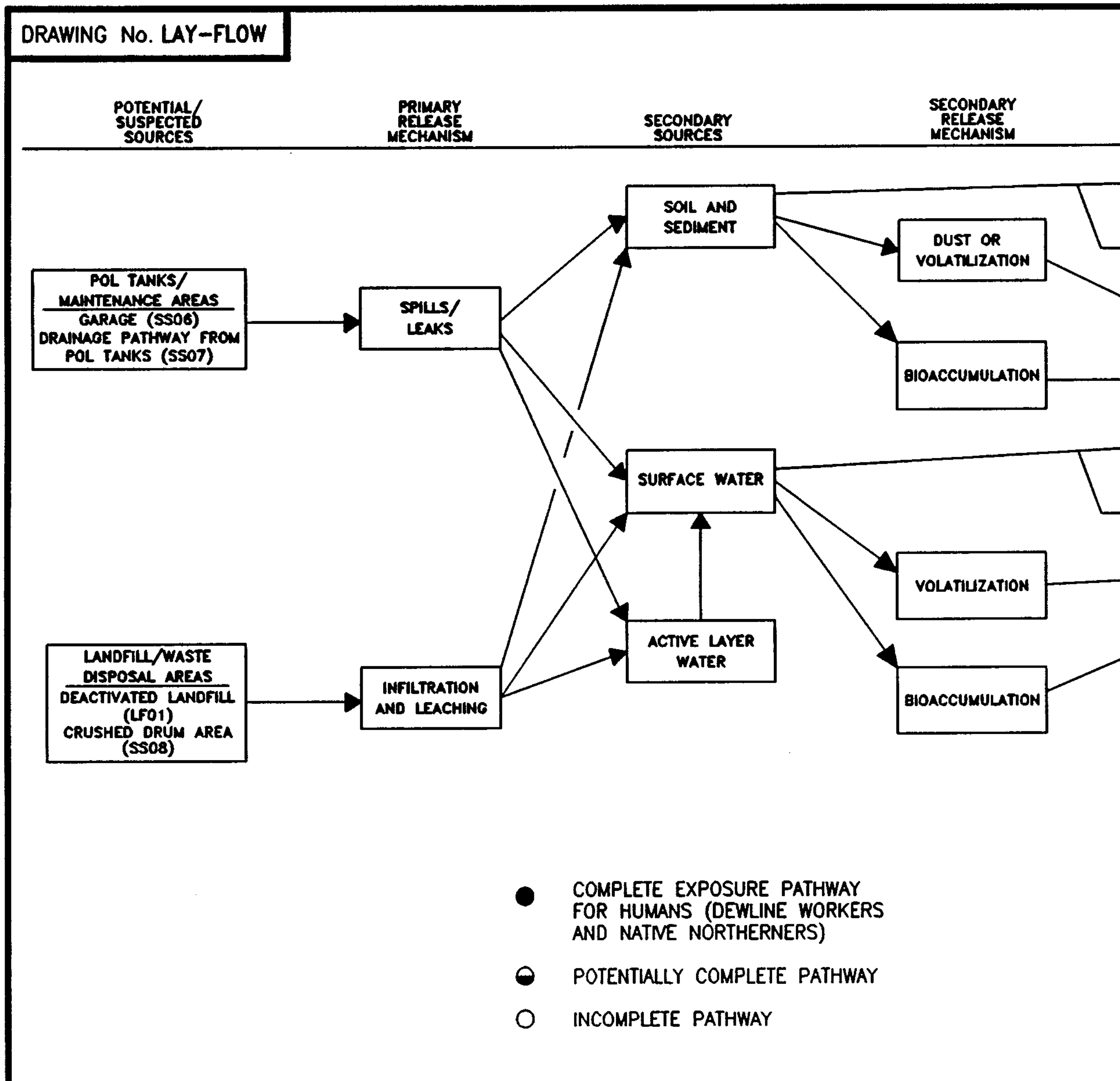
ALASKA REMOTE RADAR INSTALLATIONS

USAF 611th CES

FIGURE NO. 2-3

POTENTIAL MIGRATION PATHWAYS

THIS PAGE INTENTIONALLY LEFT BLANK



BULLEN POINT RADAR INSTALLATION

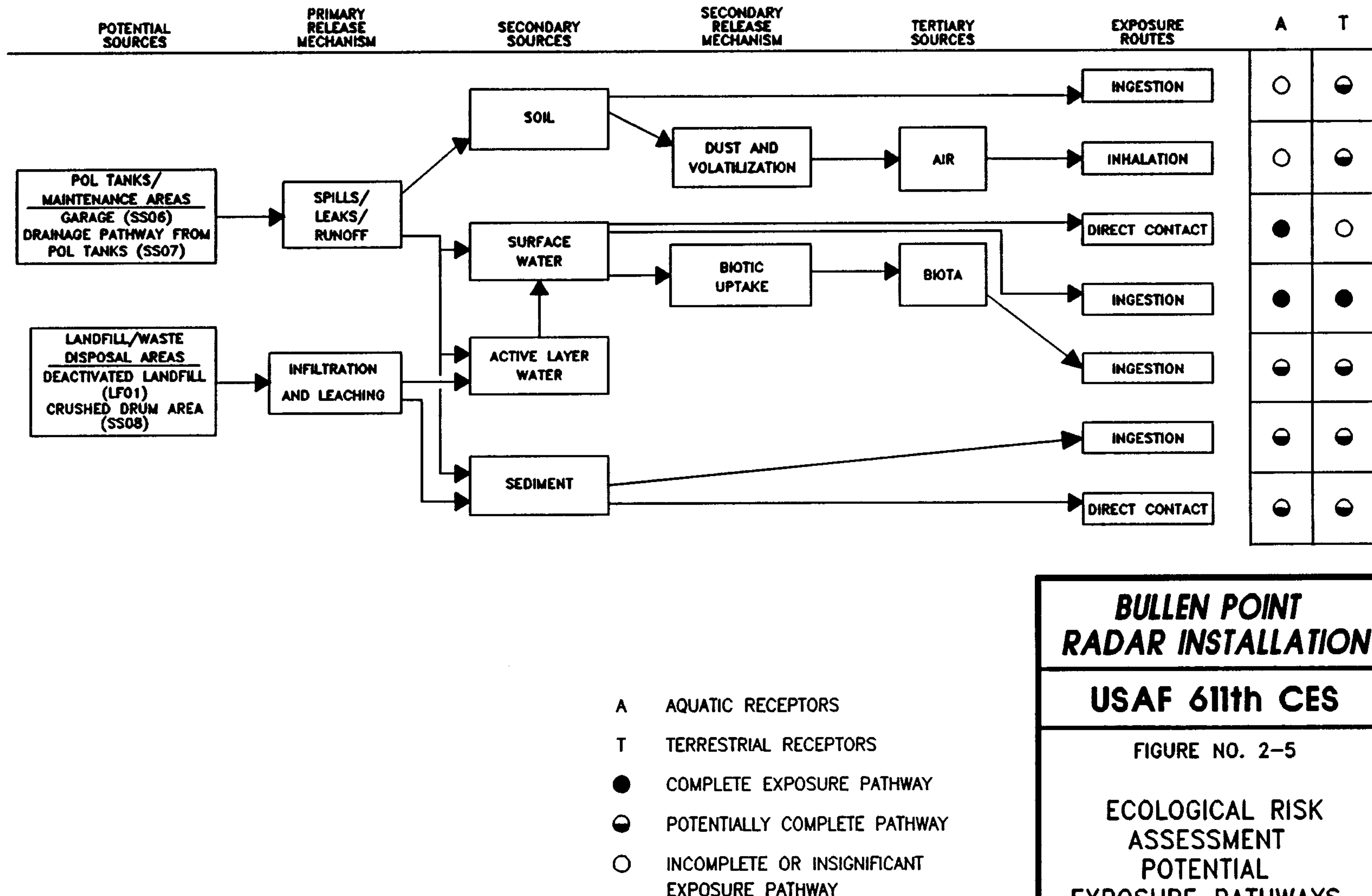
USAF 611th CES

FIGURE NO. 2-4

HUMAN HEALTH RISK ASSESSMENT POTENTIAL EXPOSURE PATHWAYS

THIS PAGE INTENTIONALLY LEFT BLANK

DRAWING No. LAY-FLO



BULLEN POINT RADAR INSTALLATION

USAF 611th CES

FIGURE NO. 2-5

ECOLOGICAL RISK ASSESSMENT POTENTIAL EXPOSURE PATHWAYS

THIS PAGE INTENTIONALLY LEFT BLANK

beach bluffs. The surrounding terrain is generally marshy. Gravel pads and roads rise approximately four to five feet above the tundra and account for most of the local topography at the site.

The most prominent topographic features, visible from the air and ground surface, are ice wedge polygons. These features are formed by cracking of the ground surface during thermal contraction, followed by the infiltration of water. The water then freezes and forces the crack wider. Repeated freeze-thaw cycles enlarge these features, which form small troughs and may fill with water. Intersecting troughs form polygonal arrangements, that range from a couple of feet to tens of feet across.

Two types of ice wedge polygons exist: low centered and high centered. In low centered polygons, the middle of the polygon is depressed to form a small basin, which may fill with water. A cross-section of one of these basins would reveal an ice-wedge trough on either side of the polygon, berms lining both sides of the troughs, and a basin filling the interior space between the berms. A high centered polygon does not have a depressed center, and consists of intersecting troughs with higher ground in the middle.

Another prominent tundra feature consists of oriented lakes. These lakes, which form from low centered polygons, are enlarged by the erosional action of wind-induced waves. These lakes are generally not circular but oblong, with the long axis of the lake normal to the prevailing wind direction. They can "migrate" across the tundra at an average rate of three feet per year (Livingstone 1954) and have a stable depth of approximately 10 feet (Hussey and Michaelson 1966).

2.4.4.2 Stratigraphy. The stratigraphy at Point Lay was examined during RI activities down to the level of the permafrost (generally no deeper than two to four feet during August and September 1993). The upper-most features at the site are gravel roads and pads of human origin. These features, which are limited in areal extent, have a maximum height of approximately six feet. They generally consist of well-graded sandy gravels with sub-angular to sub-rounded, very fine to coarse sands and sub-angular to sub-rounded gravel clasts ranging from one-quarter inch to one and one-half inches (although gravel clasts ranging up to four inches or more are occasionally encountered). The grains are unconsolidated, and fine material (silts or clays) may be present in minor quantities.

Gravel pads and roads were constructed on top of native tundra, which occurs throughout the site. The top of the tundra consists of a vegetative mat in a loamy/silty matrix. This mat can reach several inches in thickness. Underlying the tundra mat are fine to coarse sands and gravels, dark brown organic clays, and silt layers. The depth to permafrost beneath the tundra was approximately two feet during the 1993 RI.

2.4.4.3 Subsurface Migration. Active layer water flow under the tundra is hampered by the presence of numerous wet depressions and the relatively flat topography; because the depth to permafrost under these depressions is increased, they tend to act as small catchment basins. These basins limit the potential for the horizontal flow of active layer water (Miller et al. 1980; Robertson 1988). The active layer water flow in these areas is so inhibited that it can contribute

little to the midsummer water budget of tundra streams. Most of the active layer water contribution to these streams is from immediately adjacent well-drained slopes (Robertson 1988).

Some generalizations about active layer water flow can be made. Due to the combined effects of low topographic relief and the presence of numerous catchment basins, active layer water migration through areas of tundra is a slow process. The active layer water contribution to tundra streams is mainly from well-drained slopes next to those streams. The active layer water flow that does occur is governed by changes in topographic relief and is limited to spring and summer months, with the active layer functioning as a shallow, unconfined aquifer. The water table in such an aquifer tends to mimic topographic features, and active layer water flow is driven by elevation changes. Figure 2-6 illustrates how the elevation changes of gravel roads and berms can restrict active layer water flow.

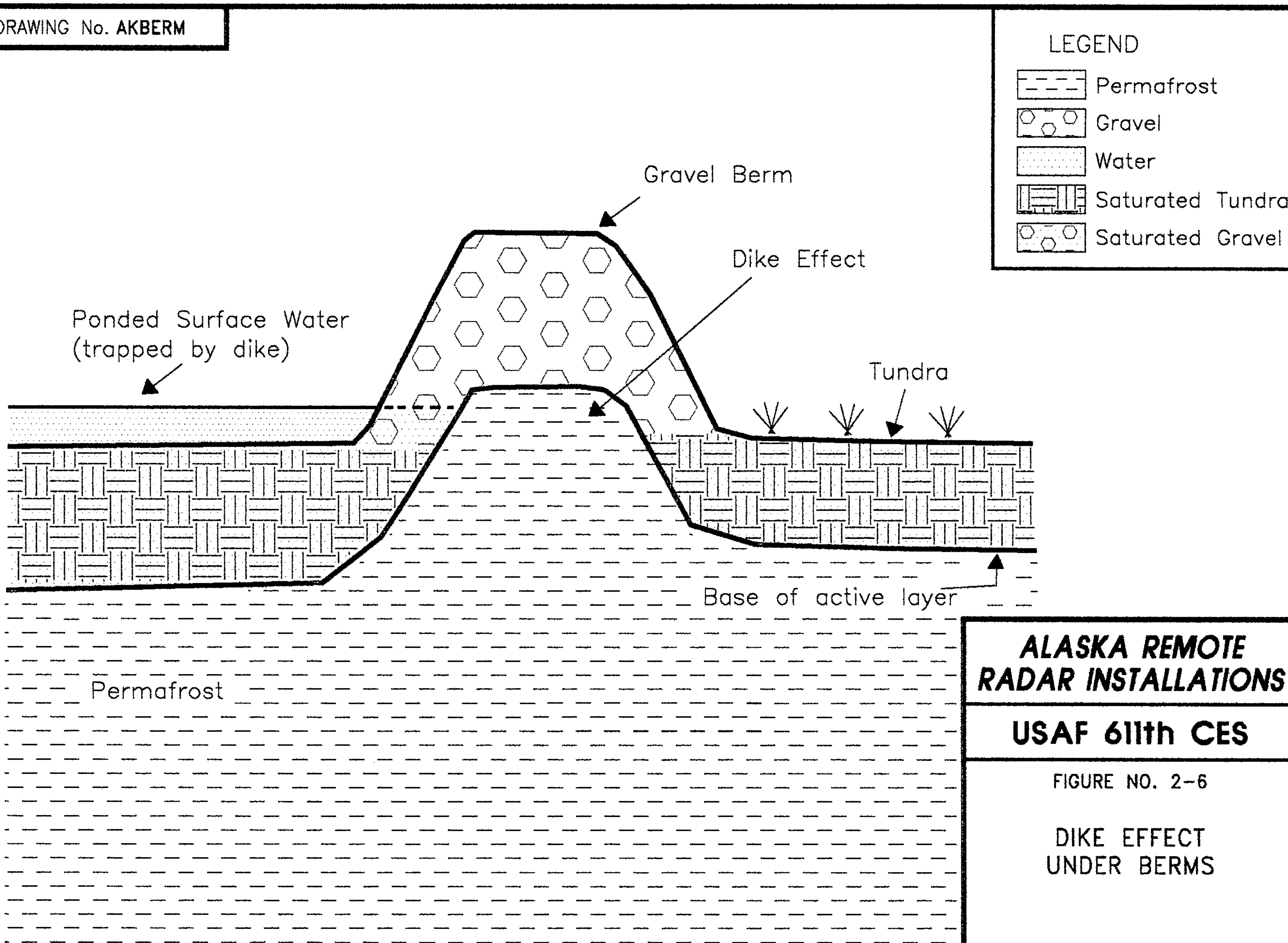
2.4.4.4 Surface Migration. Surface migration at Point Lay may occur as a result of the flow of surface water from topographic highs to topographic lows. Surface water flow during the spring thaw, when mounds of snow can channel drainage in unexpected directions, can be markedly different from flow during the summer months. The general surface migration features and directions are depicted in Figure 1-8.

The main factors controlling surface water flow are the topography and water availability. The topography at the Point Lay installation has very little relief; therefore, there is only a small gradient to drive surface water flow. Combined with the depressions formed by the ice wedge polygons, this creates a multibasinal drainage pattern in which much of the surface water is directed into depressions and small tundra ponds, rather than draining directly into drainage channels. Gravel pads provide the greatest topographic relief at the installation. Surface migration is generally radial out from the gravel pads.

Based upon precipitation alone, Point Lay could classify as a desert (Robertson 1988). Precipitation along the Chukchi Sea coast averages only seven inches per year (Dingman et al. 1980; Walker et al. 1980). Additionally, 65 percent of the precipitation on the North Slope is in the form of snow (Walker et al. 1980). Most surface water flow occurs during the spring, when melting snow and ice release stored water over a relatively short time-frame and the active layer remains partially frozen. This creates a situation in which there is a large supply of surface water and very little capacity for infiltration. The result is the overland sheet flow (Robertson 1988), during which drainage is not confined to local drainage features but may travel in a sheet-like fashion over the topography. Snow, ice, and man-made features (gravel pads and roads) may also result in barriers that force the flow of surface water in directions different from those dictated by the underlying ground surface.

There is comparatively little flow of surface water during the summer. In fact, arctic wetlands exist because the lack of significant vertical relief retards the horizontal flow of surface water, and permafrost limits downward flow (Robertson 1988). Overflow from tundra ponds is generally dependant upon summer rainfall.

DRAWING No. **AKBERM**



ALASKA REMOTE RADAR INSTALLATIONS

USAF 611th CES

FIGURE NO. 2-6

DIKE EFFECT UNDER BERMS

THIS PAGE INTENTIONALLY LEFT BLANK

The potential for contaminant migration in surface water is, therefore, greatest during the spring thaw, which is of relatively short duration, during which the precise direction of flow may be difficult to determine.

No large streams cross the installation and enter Kasegaluk Lagoon. A few small, poorly defined streams and drainage ditches drain local areas of the installation. These features become better defined and slightly incised near the beach bluffs adjacent to Kasegaluk Lagoon.

2.4.4.5 Air Transport. Air transportation of contaminants is not considered to be a significant migration pathway at Point Lay. The frozen conditions encountered most of the year are not conducive to the volatilization of organic contaminants or to the transport of affected dust and dirt. During the summer months the air and ground temperatures remain relatively low (reducing volatility) and the abundant supply of moisture retards the entrainment of affected dust.

2.4.5 Receptors

Three potential human receptor groups were evaluated for the Point Lay Risk Assessment: an adult assigned to a DEW Line installation (worker), an adult native of the North Slope of Alaska (native), and a native child (child). These receptor groups represent the reasonable maximum exposure at an installation that is in close proximity to a native village and may be released for civilian use at some time in the future.

The primary routes of human exposure evaluated in the Point Lay Risk Assessment are incidental ingestion of soil/sediment and ingestion of surface water.

For the ecological evaluation it was assumed that terrestrial and aquatic species are potential receptors for at least the six months of the year when the region is not ice and snow covered. In addition, it was assumed that species that occur at great distances from the specific installations are not receptors (e.g., whales). Whales may migrate off-shore from the DEW Line installation; it is unlikely, however, that these mammals are potential receptors to COCs released from the sites because of dilution of surface water entering the Arctic Ocean and the distance off-shore that these animals migrate. Potential ecological receptors evaluated in the ERA were discussed in Section 2.4.2.

The potential human health and ecological risks to receptors associated with the contaminants detected at the Point Lay sites are reported on a site-specific basis in Section 3.0.

THIS PAGE INTENTIONALLY LEFT BLANK

3.0 REMEDIAL INVESTIGATION - REMEDIAL ACTION SITES

This section of the RI/FS presents results from RI sampling and analysis activities for each of the four Point Lay sites where remedial action may be warranted. The four sites considered for remedial action and discussed in this section are the Deactivated Landfill (LF01), Garage (SS06), Drainage Pathway from POL Tanks (SS07), and Crushed Drum Area (SS08). Each of the sites is presented individually in Sections 3.1 through 3.4. (Note: figures and tables are presented at the end of each section.) The information presented for each site includes site background, field sampling and analytical results, potential migration pathways, human health and ecological risk assessment summaries, and conclusions and recommendations. The site-by-site discussions in this section are intended to provide the reader with all information needed to understand the site conditions and make decisions regarding appropriate action for each of the sites.

Photographs of the Point Lay installation and the sites investigated during the RI are presented in Appendix B. Data tables in this section list analytical results from samples in which chemicals were detected above quantitation limits. Complete laboratory analytical data sheets for each sample, including quantitation limits for non-detected analytes, are presented in Appendix F.

3.1 DEACTIVATED LANDFILL (LF01)

3.1.1 Site Background

The Deactivated Landfill (LF01) site is located southeast of the hangar. It was the installation landfill from 1973 to 1987. At the time of closure, the area was cleared of major surface debris, graded, covered with gravel, and seeded with grass. A small seasonal stream appears to be eroding the landfill cover, exposing rusty drums and landfill debris. Standing water along the landfill's western edge and surface runoff from the gravel pad area south of the hangar are possible source areas for the small stream. The water downstream from the landfill showed minor discoloration and biogenic sheen.

Previous sampling, conducted in 1987 by Air Force contractors, detected VOCs and SVOCs in surface water at the site. A detailed list of source areas, contaminants, and concentrations previously detected is presented in the RI/FS Work Plan (U.S. Air Force 1993a).

The site-specific environmental setting describing the topography, surface water drainage, and soil types is presented in the discussion of potential migration pathways, Section 3.1.3.

3.1.2 Field Sampling and Analytical Results

This section describes the RI sampling and analytical results for samples collected at the Deactivated Landfill (LF01) site. The discussion presents a review of laboratory data, data summary tables, contaminants identified, contaminant trends, and information on suspected source areas.

3.1.2.1 Summary of Samples Collected. A total of 22 samples was collected from tundra and the overgrown gravel cap at the site. These consisted of 13 sediment and 9 surface water samples. Table 2-2 presents a detailed summary of the samples collected and the analyses performed during the 1993 RI field activities. Locations of all samples collected at the Deactivated Landfill (LF01) site are presented in Figure 3-1.

Thirteen sediment samples were analyzed for DRPH and GRPH. In addition, ten sediment samples were analyzed for RRPH, BTEX, HVOCs, and PCBs. Four samples were analyzed for VOCs, and one sample was analyzed for SVOCs, pesticides, total metals, TOC, TSS, and TDS.

The nine surface water samples were analyzed for DRPH and GRPH. In addition, seven samples were analyzed for RRPH, BTEX, HVOCs, and PCBs. Three samples were analyzed for VOCs, and one sample was analyzed for SVOCs, pesticides, total and dissolved metals, TOC, TSS, and TDS.

3.1.2.2 Analytical Results. The data summary table (Table 3-1) presents analytical results for all samples collected at the site. Detection and quantitation limits, action levels, associated laboratory and field blanks, and background analytical results are presented for each of the analyses. Background levels are listed to allow direct comparison of naturally occurring organic compounds and inorganic analytes with samples collected from the site. Sample locations and analytical results for the samples at the site are illustrated in Figure 3-1. All organic compounds detected are presented on the figure except when they were a result of laboratory contamination or field decontamination procedures. Only metals detected above background levels that exceed an RBSL or ARAR are presented on Figure 3-1. The exceptions are presented on the data summary table.

The following section presents a discussion of organic compounds and inorganic analytes detected above background levels at the site. A discussion of TDS, TSS, and TOC is included.

Organics. Organic compounds detected in soil samples collected at the site include DRPH, GRPH, BTEX compounds, five other VOCs, and one SVOC. DRPH were detected in two sediment samples at 624 and 39.9 mg/kg (LF01-2SD13 and LF01-2SD14, respectively). GRPH were detected at low concentrations in two sediment samples at 1.73 and 11.9 mg/kg (LF01-2SD12 and LF01-2SD14, respectively). BTEX (total) was detected at very low levels in two samples at 0.408 and 0.724 mg/kg; xylenes were the primary component. Five other VOCs (tetrachloroethene, p-isopropyltoluene, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene) and one SVOC (benzyl alcohol) were detected at very low concentrations (0.042 to 1.38 mg/kg) in three sediment samples.

In surface water samples, organic compounds detected at the site include DRPH, GRPH, BTEX, and 11 other VOCs. DRPH were detected in two samples at 181 and 240 μg/L (LF01-2SW09 and LF01-2SW10, respectively). GRPH were detected in surface water sample LF01-2SW09 at 223 μg/L. BTEX compounds were detected in three surface water samples at concentrations ranging from 1.1 to 23 μg/L; benzene was the primary component. Eleven other VOCs were detected at concentrations ranging from 1.3 to 109 μg/L. The primary components were dichlorodifluoromethane (58 μg/L) and tetrachloroethene (109 μg/L).

Inorganics. In sediments, metals analyses indicated that three metals (copper, iron, and zinc) were detected above background levels at the site. TOC were reported at 28,400 mg/kg in sediment sample LF01-SD04/SD08.

In surface water samples, four metals (barium, iron, manganese, and potassium) were detected above background concentrations. In surface water sample LF01-SW04/SW08, TOC, TSS, and TDS were reported at 20,400, 96,000, and 870,000 μg/L, respectively.

3.1.2.3 Summary of Site Contamination. Previous sampling conducted at the Deactivated Landfill (LF01) detected VOCs and SVOCs at low concentrations in the surface waters bordering the landfill. The results and sources of previous sampling efforts are presented in the RI/FS Work Plan (U.S. Air Force 1993a). The quality of the previous IRP sampling data is unknown as is the data validation, if any, that these data have undergone.

During previous sampling, conducted in 1987, nine VOCs and SVOCs were detected in two surface water samples. The VOCs and SVOCs were detected at concentrations ranging from 1.2 to 17 μg/L; the primary components were methylene chloride (17 μg/L), trichlorofluoromethane (9.3 μg/L), and tetrachloroethene (6.4 μg/L).

A comparison of historical and current project data indicates that there is a higher concentration of VOCs in surface water at the site than there has been in the past. VOCs were detected during the 1993 RI at concentrations up to 109 μg/L (tetrachloroethene) and 58 μg/L (dichlorodifluoromethane). Petroleum compounds (DRPH and GRPH) were detected during the current RI in soil (624 and 11.9 mg/kg, respectively) and in surface water (240 and 223 μg/L, respectively). Differences between past and current data are likely to be a result of more extensive sampling during the 1993 RI.

The human health and ecological risks associated with the chemicals detected at the site are presented in Sections 3.1.4 and 3.1.5. The suspected source of contaminants detected during sampling conducted at the Deactivated Landfill site is buried garbage and debris from previous waste disposal practices. The landfill has been inactive since 1987.

Based on field data, source of contamination, and concentration of the contaminants, the contaminated soil and landfill debris area are limited to approximately 5,625 square feet located south of the hangar and adjacent to the lagoon.

3.1.3 Migration Pathways

This section describes the topography and stratigraphy of the site and the migration potential of contaminants from the site. A discussion of receptors and chemical concentrations at receptors is included.

3.1.3.1 Topography and Stratigraphy. The landfill area consists of a revegetated gravel cap, beach bluff, beach, and small intermittent streams. The topography throughout most of the site is relatively flat except near the lagoon, where the ground surface drops approximately eight feet down to a beach. Small streams have eroded gullies along the eastern edge and into the

southern edge of the site near the beach bluff. Landfill debris is present along exposed landfill faces, particularly in the gully eroding into the south portion of the site, where several crushed drums are visible.

The active layer at this site was approximately two feet thick in tundra areas and four feet thick under gravel pads and roads during the 1993 RI. Gravel pad material consisted of the typical gravels and sands associated with these features, and subsurface tundra materials were of the typical stratigraphy found at Point Lay (Section 2.4.4.2).

3.1.3.2 Migration Potential.

Subsurface Migration. Three small streams are located at the site. Sluggish ephemeral streams are located on the western and eastern edges of the site. The western stream terminates at a small pond adjacent to the west edge of the gravel pad and is a potential source of water for the stream eroding into the southern portion of the site. Samples collected from the stream eroding into the southern portion of the landfill indicate that surface water and sediments have been contaminated with DRPH, GRPH, and VOCs. Upgradient samples from the eastern and western streams were uncontaminated, indicating that the contaminant source is in the landfill. For this reason, the potential for subsurface contaminant migration is considered high.

Surface Migration. Analytical data indicate that surface water and sediments in the southern stream have been contaminated with DRPH, GRPH, and VOCs. Because this stream discharges into the immediate vicinity of Kasegaluk Lagoon, the potential for offsite contaminant migration in surface water is considered to be high. Samples collected in the eastern and western streams indicate that these streams were not affected.

Air Transport. Air transportation is not considered to be a significant mode of migration at the site (Section 2.4.4.5).

Summary of Migration Potential. Analytical data indicate that surface water and sediments in the stream eroding into the southern portion of the site have been contaminated with DRPH, GRPH, and VOCs. The upgradient samples collected from the western stream, which is a potential water source for the southern stream, were not affected, indicating the contaminant source is the landfill. The potential for contaminant migration in surface and subsurface water is considered to be significant.

3.1.3.3 Receptors and Chemical Concentrations at Receptors.

Human Receptors. Potential human receptors at the Deactivated Landfill (LF01) site include Air Force contractor personnel working at the station, visitors to the station, and an occasional local visitor passing the site to get to recreational or subsistence lands. Human receptors could potentially be exposed to the chemicals detected in surface water and soil/sediments at the site. The primary routes of potential exposures at the site are direct contact with, and incidental ingestion of, soil/sediment and ingestion of surface water. Because ground water and air at the Point Lay sites are not considered complete pathways of exposure, these media are not evaluated as potential pathways to human receptors.

The Point Lay Risk Assessment (U.S. Air Force 1996) evaluates in detail the risks to human health from all COCs detected at the site. The potential receptor groups were selected based on their likelihood of exposure to contaminants at the site and include DEW Line workers at the installation, and native adults and children who may visit the site. The estimated exposure point concentrations for human receptors are based on the maximum concentration of each chemical detected at the site. The potential risks to human health associated with site chemicals at Point Lay are presented in Section 3.1.4.

Ecological Receptors. Ecological receptors were evaluated in detail in the Point Lay Risk Assessment (U.S. Air Force 1996) to determine if plants and animals could potentially be affected by the chemicals detected at the Point Lay installation. Because of the diversity of the plants and animals in the area of the Point Lay installation, a set of representative species was selected in the ERA for detailed evaluation. The species include plants, aquatic invertebrates, fish, birds, and mammals. These receptors were selected based on the likelihood of exposure given their preferred habitat and feeding habits. The representative species encompass a range of ecological niches in order to achieve the best characterization of the ecosystems being examined and are presented in Table 2-6.

The estimate of chemical concentrations at the ecological receptors was based on the average site-wide concentration of each COC. This approach was appropriate because few of the representative species would inhabit only one distinct site at the installation; they are more likely to be exposed to the mix of chemicals and concentrations detected on all the sites at Point Lay. The potential ecological risks associated with the chemicals at detected at the site are presented in Section 3.1.5.

3.1.4 Human Health Risk Assessment

This section presents a summary of the potential human health risks associated with the chemicals detected at the Deactivated Landfill (LF01) site. The purpose of the human health risk assessment is to quantify the excess lifetime cancer risk and/or the noncancer hazard (reported as hazard index) from the chemicals detected at the site.

This summary presents the COCs at the site, the pathways by which human receptors may be exposed to site chemicals, potential risks to human health posed by each chemical through each exposure pathway, the significance of the risk and/or hazard estimate, and a comparison of site chemical concentrations to ARARs. The methods and assumptions used in calculating hazards and risks are presented in Section 2.4.1.

3.1.4.1 Chemicals of Concern. At the Deactivated Landfill (LF01), the only COC identified in soil/sediment at the site was DRPH. The concentration of DRPH exceeded the background concentration and the ARAR concentration for petroleum hydrocarbon contamination of soil (ADEC 1991).

GRPH, benzene, tetrachloroethene, trichloroethene, dichlorodifluoromethane, and manganese were identified as COCs for surface water at the site. GRPH exceeded the RBSL based on cancer risk. Benzene exceeded the RBSL based on cancer risk and the ARAR concentration for

benzene contamination of soil (ADEC 1991). Dichlorodifluoromethane and manganese exceeded their RBSLs based on noncancer hazard. Trichloroethene exceeded the RBSL based on cancer risk. Tetrachloroethene exceeded the RBSLs based on noncancer hazard and cancer risk and the surface water ARAR, which is a maximum contaminant level (MCL) promulgated under the federal Safe Drinking Water Act.

Table 3-2, Identification of COCs at the Deactivated Landfill, presents the maximum concentrations of chemicals detected at the site, the associated background concentrations, RBSLs, and ARARs, and identifies COCs selected in the risk evaluation.

3.1.4.2 Exposure Pathways and Potential Receptors. Because COCs were identified for soil/sediment and surface water at the site, the potential risks associated with ingestion of soil/sediment and surface water were evaluated in the risk assessment.

Three potential receptor groups were evaluated in the risk assessment: an adult assigned to a DEW Line installation (worker), an adult inhabitant of communities in the North Slope of Alaska (native), and a child living in a North Slope community (child).

3.1.4.3 Risk Characterization.

Noncancer Hazard and Cancer Risk Associated with Soils and Sediments. The noncancer hazard associated with the ingestion of soil by a hypothetical native northern adult/child is 0.009, and by a DEW Line worker is <0.001, based on the maximum concentrations of the COCs. The presence of DRPH accounts entirely for the quantifiable noncancer hazard for these receptor/pathway combinations.

No carcinogenic COCs were identified for the soil/sediment at the site; therefore, the excess lifetime cancer risk associated with ingestion of soil/sediment cannot be quantified.

Noncancer Hazard and Cancer Risk Associated with Surface Water. The noncancer hazard associated with the ingestion of surface water at the Deactivated Landfill by a hypothetical native northern adult or by a DEW Line worker is 2.9 based on the maximum concentrations of the COCs. Manganese, GRPH, tetrachloroethene, trichloroethene, and dichlorodifluoromethane account for the quantifiable noncancer hazard for these receptor/pathway combinations. Manganese alone accounts for more than 90 percent of this noncancer hazard.

The excess lifetime cancer risk associated with the ingestion of surface water at the site by a native northern adult is 7×10^{-5}, and by a DEW Line worker is 1×10^{-5}, based on the maximum concentrations of the COCs. The presence of GRPH, benzene, and tetrachloroethene accounts entirely for the quantifiable excess lifetime cancer risk for these receptor/pathway combinations. Tetrachloroethene alone accounts for 90 percent or more of the cancer risk.

3.1.4.4 Summary of Human Health Risk Assessment. The potential risks and hazards associated with the soil/sediment at the Deactivated Landfill site are limited to the low noncancer hazards (hazard indices of 0.009 and <0.001) associated with DRPH. These noncancer hazards

are below one and were calculated conservatively based on a residential scenario. Therefore, the noncancer risks associated with soil/sediment at the site are minimal.

A hazard index of 2.9 is associated with the COCs, primarily manganese, in surface water at the site indicating a minimal noncancer risk. The cancer risk for the native adult is 7×10^{-5}, and for a DEW Line worker is 1×10^{-5}; neither exceed the 1×10^{-4} threshold level at which remediation is usually recommended (EPA 1991b). The potential hazards and risks were calculated assuming the affected surface water would be used as a sole-source water supply for 180 days per year. Based on site-specific information, the chemicals in surface water do not currently pose a health hazard nor are they likely to pose a hazard in the future. The surface water expressions at the site are frozen most of the year; many are only intermittently filled with water during the summer months. The surface water at the site is not known to be used as a water supply now, nor has it been used in the past. In conclusion, under current uses the COCs identified in surface water at the Deactivated Landfill site pose only a minimal, if any, potential threat to human health. In the unlikely event that surface water at the site is used as a sole-source drinking water supply in the future, a potential noncancer hazard to human health could exist if conditions remain constant.

In conclusion, under current uses the COCs identified soil/sediment and surface water at the Deactivated Landfill pose only minimal, if any, potential threat to human health. Based on the human health risk assessment, remedial actions are not warranted at the site.

3.1.5 Ecological Risk Assessment

The objective of the ERA is to estimate the potential impacts of chemicals detected at the installation on aquatic and terrestrial plants and animals. A summary of the methods used to assess potential ecological impacts is presented in Section 2.4.2.

3.1.5.1 Chemicals of Concern. COCs for the ERA were selected based on criteria presented in Section 3.1 of the ERA. The average installation-wide concentration of COCs were used to calculate the risk estimates. All sites at the installation were considered to be potentially usable habitat. The COC selection process only considered the soil/sediment samples that were at or less than 1.5 feet deep. The soil/sediment samples were screened for depth because it is unlikely that any of the representative species will be exposed to soil/sediments deeper than 1.5 feet. Iron, manganese, and DRPH were identified as COCs in surface water at the Deactivated Landfill, and the COCs in soils/sediments were DRPH, GRPH, toluene, ethylbenzene, xylenes, tetrachloroethene, benzyl alcohol, lead, and zinc. None of the identified COCs was associated with significant risk estimates at the Deactivated Landfill site.

3.1.5.2 Summary of Ecological Risk Assessment. Based on the quantification of potential risks to ecological receptors and discussions presented in the Point Lay ERA, ecological risks at the Deactivated Landfill are minimal.

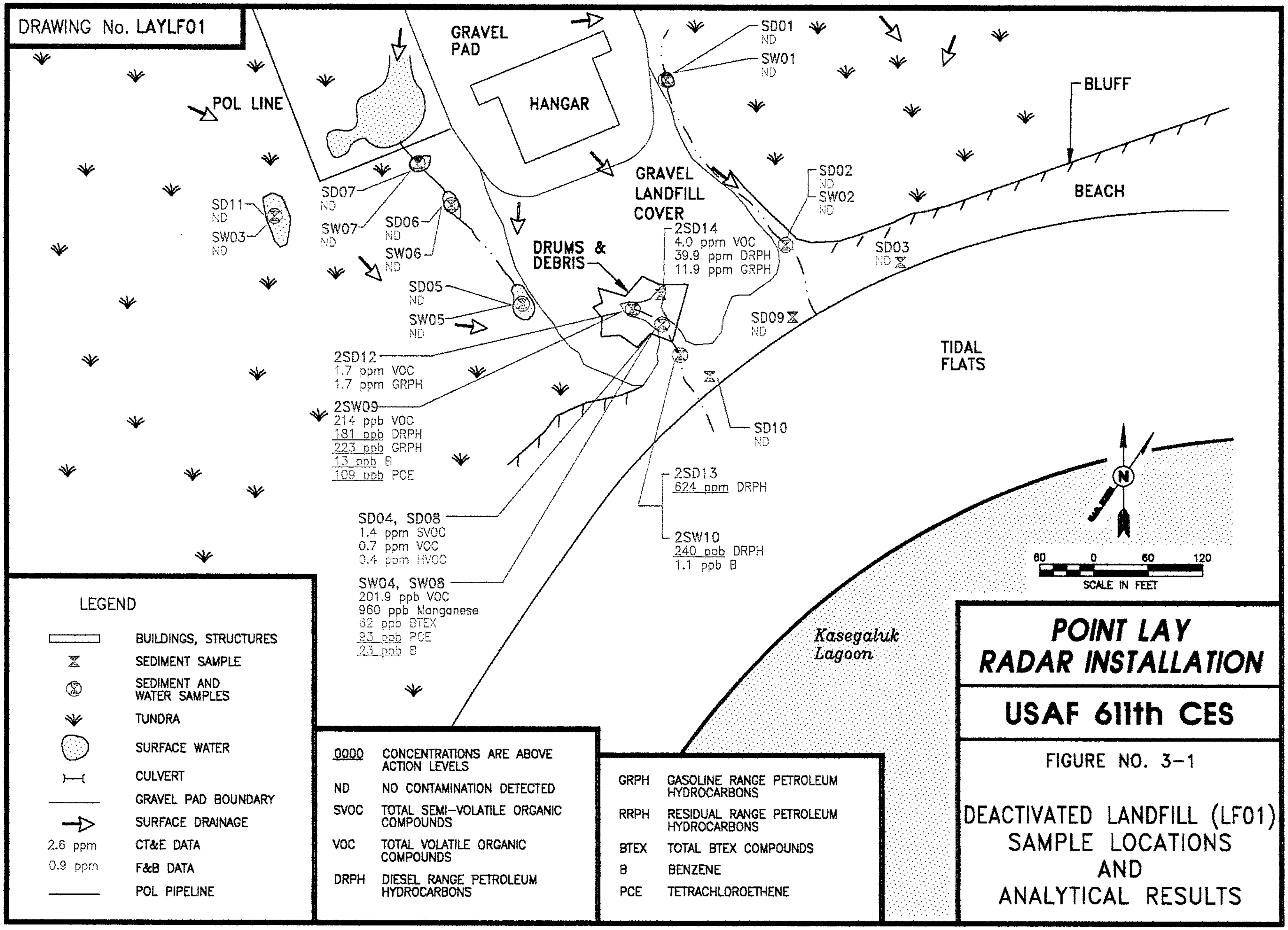
3.1.6 Conclusions and Recommendations

Sampling and analyses have determined that the Deactivated Landfill (LF01) site is contaminated with petroleum compounds and VOCs. The contaminated media at the site include surface water, soil/sediment, and landfill debris south of the hangar. The source of contamination is suspected to be buried garbage and debris from previous waste disposal practices. The landfill has been inactive since 1987.

Migration of contaminants from the site appears to have been occurring. Affected media is estimated to be approximately 5,625 square feet of landfill material and associated soil cover. Surface water drainage is eroding into the landfill materials, and analytical data suggest that migration of contaminants is occurring.

The risk assessment concluded that risks posed to human health or ecological receptors by site contaminants are minimal given current or future site uses. A low potential noncancer hazard was identified in the human health risk assessment from COCs in surface water, primarily manganese; however, the risks and hazards are based on a conservative future scenario and are not of a magnitude that normally requires remedial action. The ERA concluded that the overall potential risks posed by site contaminants are minimal. Therefore, considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Levels of DRPH, GRPH, and VOCs detected in site surface water do exceed ADEC guidance cleanup levels, and migration of contaminants has occurred. Therefore, the site is being recommended for remedial action. The source area at the site consists of approximately 5,625 square feet (625 cubic yards) of landfill debris and soil. The remedial action alternative recommended for the site is offsite incineration. A complete description and evaluation of the remedial alternatives considered for this site are presented in the FS, Section 4.0.



DRAWING No. LAYLF01
POL LINE
GRAVEL PAD
HANGAR
GRAVEL LANDFILL COVER
DRUMS & DEBRIS
BLUFF
BEACH
TIDAL FLATS
Kasegaluk Lagoon
SD01 ND
SW01 ND
SD02 ND
SW02 ND
SD03 ND
SD05 ND
SW05 ND
SD06 ND
SW06 ND
SD07 ND
SW07 ND
SD09 ND
SD10 ND
SD11 ND
SW03 ND
2SD14
4.0 ppm VOC
39.9 ppm DRPH
11.9 ppm GRPH
2SD12
1.7 ppm VOC
1.7 ppm GRPH
2SW09
214 ppb VOC
181 ppb DRPH
223 ppb GRPH
13 ppb B
109 ppb PCE
SD04, SD08
1.4 ppm SVOC
0.7 ppm VOC
0.4 ppm HVOC
SW04, SW08
201.9 ppb VOC
960 ppb Manganese
62 ppb BTEX
93 ppb PCE
23 ppb B
2SD13
624 ppm DRPH
2SW10
240 ppb DRPH
1.1 ppb B
N
60 0 60 120
SCALE IN FEET
LEGEND
BUILDINGS, STRUCTURES
SEDIMENT SAMPLE
SEDIMENT AND WATER SAMPLES
TUNDRA
SURFACE WATER
CULVERT
GRAVEL PAD BOUNDARY
SURFACE DRAINAGE
2.6 ppm CT&E DATA
0.9 ppm F&B DATA
POL PIPELINE
0000 CONCENTRATIONS ARE ABOVE ACTION LEVELS
ND NO CONTAMINATION DETECTED
SVOC TOTAL SEMI-VOLATILE ORGANIC COMPOUNDS
VOC TOTAL VOLATILE ORGANIC COMPOUNDS
DRPH DIESEL RANGE PETROLEUM HYDROCARBONS
GRPH GASOLINE RANGE PETROLEUM HYDROCARBONS
RRPH RESIDUAL RANGE PETROLEUM HYDROCARBONS
BTEX TOTAL BTEX COMPOUNDS
B BENZENE
PCE TETRACHLOROETHENE
POINT LAY RADAR INSTALLATION
USAF 611th CES
FIGURE NO. 3-1
DEACTIVATED LANDFILL (LF01) SAMPLE LOCATIONS AND ANALYTICAL RESULTS

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY

Installation: Point Lay Matrix: Sediment
Site: Deactivated Landfill (LF01) Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples							Field Blanks			Lab Blanks	
					SD01	SD02	SD03	SD04 & SD08 (Replicates)		SD05	SD06	AB01	EB02	TB02		
Laboratory Sample ID Numbers					478	480	482	484 4354-6	492 4356-13	486	488	4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356	#5-82593 #1&2-82593 4354 4356
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	5-19	50-190	500[a]	<50[b]-<100[b]	<160[b]	<190[b]	<50[b]	<60[b]	<100[b]	<60R[b]	<80[b]	NA	<1,000[b]	NA	<1,000	<50
GRPH	0.1-3.2	1-32	100	<3J[b]-<4J[b]	<32J[b]	<4J[b]	<1J[b]	<1J[b]	<2J[b]	<1J[b]	<2J[b]	NA	<100J[b]	<100J[b]	<100J	<1J
RRPH (Approx.)	10-40	100-400	2,000[a]	<100	<300	<400	<100	<120	<200	<120	<200	NA	<2,000	NA	<2,000	<100
BTEX (8020/ 8020 Mod.)			10 Total BTEX	<0.13-<0.20	<3.17	<0.81	<0.10	<0.15	<0.20	<0.15	<0.20					
Benzene	0.002-0.007	0.02-0.07	0.5	<0.02-<0.04	<0.07	<0.07	<0.02	<0.03	<0.04	<0.03	<0.04	<1[c]	<1	<1	<1	<0.02
Toluene	0.002-0.006	0.02-0.6		<0.02-<0.04	<0.6	<0.07	<0.02	<0.03	<0.04	<0.03	<0.04	<1[c]	<1	<1	<1	<0.02
Ethyl-benzene	0.002-0.12	0.02-1.2		<0.03-<0.04	<1.2	<0.07	<0.02	<0.03	<0.04	<0.03	<0.04	<1[c]	<1	<1	<1	<0.02
Xylenes (Total)	0.004-0.13	0.04-1.3		<0.04-<0.08	<1.3	<0.4	<0.04	<0.06	<0.08	<0.06	<0.08	<2[c]	<2	<2	<2	<0.04
HVOC 8010																
Tetrachloro-ethene	0.002-0.007	0.02-0.07		<0.03J-<0.04J	<0.07J	<0.07J	<0.02J	<0.03J	0.4J	<0.03J	<0.04J	NA	<1	<1	<1	<0.02J
VOC 8260																
Tetrachloro-ethene	0.020	0.025-0.050		<0.030-<0.150	NA	NA	NA	0.306J	0.622	NA	NA	<1	<1	<1	<1	<0.020

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
R Result has been rejected.
a The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Deactivated Landfill (LF01)
Matrix: Sediment
Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples							Field Blanks			Lab Blanks	
					SD01	SD02	SD03	SD04 & SD08 (Replicates)		SD05	SD06	AB01	EB02	TB02		
Laboratory Sample ID Numbers					478	480	482	484 4354-6	492 4356-13	486	488	4356-5	557/572 4356-2	569 4356-1	#5-82793 4356	#5-82593 4354 4356
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
1,2,4-Trimethyl-benzene	0.020	0.025-0.050		<0.030-<0.150	NA	NA	NA	0.055J	0.057	NA	NA	<1	<1	<1	<1	<0.020
SVOC 8270																
Benzyl alcohol	0.200	0.400		<8.9-<15.0	NA	NA	NA	1.38	NA	NA	NA	NA	<25	NA	<10	<1.00
Pesticides	0.002-0.05	0.02-0.5		<0.02J-<0.5J	NA	NA	NA	<0.02-<0.5	<0.02-<0.5	NA	NA	NA	<0.2J-<10J	NA	NA	<0.2J-<0.5J
PCBs	0.01-0.04	0.1-0.4	10	<0.1	<0.3	<0.4	<0.1	<0.1	<0.2	<0.1	<0.2	NA	<2	NA	<2J	<0.1
TOC				57,000-69,300	NA	NA	NA	15,800	28,400	NA	NA	NA	NA	NA	NA	NA

☐	CT&E Data.
▩	F&B Data.
NA	Not analyzed.
J	Result is an estimate.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Deactivated Landfill (LF01)
Matrix: Sediment
Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples				Field Blanks			Lab Blanks	
					SD07	SD09	SD10	SD11	AB01	EB02	TB02		
Laboratory Sample ID Numbers					490	494	496	498	4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356	#5-82593 #1&2-82593
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	6-40	60-400	500[a]	<50[b]-<100[b]	<60[b]	<100[b]	<60[b]	<400[b]	NA	<1,000[b]	NA	<1,000	<50
GRPH	0.1-0.8	1-8	100	<3J[b]-<4J[b]	<1J[b]	<2J[b]	<1J[b]	<8J[b]	NA	<100J[b]	<100J[b]	<50	<1J
RRPH (Approx.)	12-80	120-800	2,000[a]	<100	<120	<200	<120	<800	NA	<2,000	NA	<2,000	<100
BTEX (8020/ 8020 Mod.)			10 Total BTEX	<0.13-<0.20	<0.15	<0.25	<0.15	<1.0					
Benzene	0.003-0.02	0.03-0.2	0.5	<0.02-<0.04	<0.03	<0.05	<0.03	<0.2	<1[c]	<1	<1	<1	<0.02
Toluene	0.003-0.02	0.03-0.2		<0.02-<0.04	<0.03	<0.05	<0.03	<0.2	<1[c]	<1	<1	<1	<0.02
Ethyl-benzene	0.003-0.02	0.03-0.2		<0.03-<0.04	<0.03	<0.05	<0.03	<0.2	<1[c]	<1	<1	<1	<0.02
Xylenes (Total)	0.006-0.04	0.06-0.4		<0.04-<0.08	<0.06	<0.1	<0.06	<0.4	<2[c]	<2	<2	<2	<0.04
HVOC 8010	0.003-0.02	0.03-0.2		<0.03-<0.04	<0.03J	<0.05J	<0.03J	<0.2J	NA	<1	<1	<1	<0.02J
PCBs	0.01-0.08	0.1-0.8	10	<0.1	<0.1	<0.2	<0.1	<0.8	NA	<2	NA	<2J	<0.1

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
a The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Deactivated Landfill (LF01)
Matrix: Sediment
Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples			Field Blanks			Lab Blanks	
					2SD12	2SD13	2SD14	AB01	2EB03	2TB03		
Laboratory Sample ID Numbers					4692-11	4692-12	4692-15	4356-5	4692-17	4692-16	4356 4692	4692 4356
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	4.00	4.00	500[a]	<50[b]-<100[b]	<4.00	624[c]	39.9[d]	NA	NA	NA	NA	<4.00
GRPH	0.400	0.400	100	<3J[b]-<4J[b]	1.73	<2.75	11.9	NA	NA	NA	NA	<0.400
VOC 8260												
Ethylbenzene	0.020	0.020-0.240		<0.03-<0.150	0.054	<0.130	<0.240	<1	<1	<1	<1	<0.020
p-Isopropyltoluene	0.020	0.020-0.240		<0.03-<0.150	0.067	<0.130	<0.240	<1	<1	<1	<1	<0.020
Naphthalene	0.020	0.020-0.240		<0.03-<0.150	0.129	<0.130	0.409	<1	<1	<1	<1	<0.020
Tetrachloroethene	0.020	0.020-0.240		<0.03-<0.150	0.727	<0.130	1.92	<1	<1	<1	<1	<0.020
Toluene	0.020	0.020-0.240		<0.03-<0.150	0.042	<0.130	<0.240	<1	<1	<1	<1	<0.020
1,2,4-Trimethylbenzene	0.020	0.020-0.240		<0.03-<0.150	0.213	<0.130	0.552	<1	<1	<1	<1	<0.020
1,3,5-Trimethylbenzene	0.020	0.020-0.240		<0.03-<0.150	0.128	<0.130	0.342	<1	<1	<1	<1	<0.020
Xylenes (Total)	0.040	0.040-0.480		<0.06-<0.300	0.312	<0.260	0.724	<2	<2	<2	<2	<0.040

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
a The action level for DRPH is based on conversations with ADEC, a final action level has not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c The laboratory reported that the EPH pattern in this sample was not consistent with an unweathered middle distillate fuel.
d The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Deactivated Landfill (LF01)		Matrix: Sediment Units: mg/kg		METALS ANALYSES										
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Samples						Field Blank			Lab Blanks
					SD04	SD08						EB02		
Laboratory Sample ID Numbers					4354-6	4356-13						4356-2		4354 4356
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg						µg/L		µg/L
Aluminum	0.35	2		1,500-25,000	2,400	2,200						<100		≤100
Antimony	N/A	56-82		<7.8-<230	<82J	<56						<100		<100
Arsenic	0.11	56-82		<4.9-8.5	<82	<56						<100		<100
Barium	0.024	1		27-390	260	190						<50		<50
Beryllium	N/A	28-41		<2.6-6.4	<41	<28						<50		<50
Cadmium	0.33	28-41		<3.0-<36	<41	<28						<50		<50
Calcium	0.69	4		360-59,000	6,300	2,600						410		<200
Chromium	0.066	1		<4.3-47	13	5.1						<50		<50
Cobalt	N/A	5.6-8.2		<5.1-12	<8.2	<5.6						<100		<100
Copper	0.045	1		<2.7-45	55	16						<50		<50
Iron	0.50	2		5,400-35,000	70,000	19,000						<100		<100
Lead	0.13	2-5.6		<5.1-22	18	<5.6						<100		<100
Magnesium	0.96	4		360-7,400	1,900	1,500						<200		<200
Manganese	0.025	1		25-290	220J	180						<50		<50
Molybdenum	N/A	2.8-41		<2.5-<11	<41	<2.8						<50		<50
Nickel	0.11	1		4.2-46	13	13						<50		<50
Potassium	23	100-410		<300-2,200	<410	280						<5,000		<5,000

☐ CT&E Data.
N/A Not available.
J Result is an estimate.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Deactivated Landfill (LF01)
Matrix: Sediment
Units: mg/kg

METALS ANALYSES

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Samples						Field Blank			Lab Blanks
					SD04	SD08						EB02		
Laboratory Sample ID Numbers					4354-6	4356-13						4356-2		4354 4356
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg						µg/L		µg/L
Selenium	1.2	56-82		<7.8-<170	<82	<56						<100		<100
Silver	0.53	2.8-41		<3-<110	<41R	<2.8						<50		<50
Sodium	0.55	5		<160-680	120	75						370		<250
Thallium	0.011	0.29-0.42		<0.2-<1.2	<0.42	<0.29						<5		<5
Vanadium	0.036	1		6.3-59	11	11						<50		<50
Zinc	0.16	1		9.2-95	380	125						<50		<50

☐ CT&E Data.
R Result has been rejected.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Deactivated Landfill (LF01)
Matrix: Surface Water
Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples						Field Blanks			Lab Blanks
					SW01	SW02	SW03	SW04 & SW08 (Duplicates)		SW05	AB01	EB02	TB02	
Laboratory Sample ID Numbers					559/592	560/597	561/598	562/601 4358-1 4356-10	566/613 4356-11 4358-4	563/604	4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356 4358
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DRPH	100	1,000		<1,000[b]	<1,000[b]	<1,000[b]	<1,000[b]	<1,000[b]	<1,000J[b]	<1,000[b]	NA	<1,000[b]	NA	<1,000
GRPH	10	100		<50J[b]	<100J[b]	<100J[b]	<100J[b]	<100J[b]	<100J[b]	<100J[b]	NA	<100J[b]	<100J[b]	<100J
RRPH (Approx.)	200	2,000		<2,000	<2,000	<2,000	<2,000	<2,000	<2,000	<2,000	NA	<2,000	NA	<2,000
BTEX (8020/8020 Mod.)														
Benzene	0.1	1	5	<1	<1	<1	<1	23	20	<1	<1[c]	<1	<1	<1
Toluene	0.1	1	1,000	<1	<1	<1	<1	9	7	<1	<1[c]	<1	<1	<1
Ethylbenzene	0.1	1	700	<1	<1	<1	<1	10J	13J	<1	<1[c]	<1	<1	<1
Xylenes (Total)	0.2	2	10,000	<2	<2	<2	<2	20J	20J	<2	<2[c]	<2	<2	<2
HVOC 8010														
Tetrachloroethene	0.1	1	5	<1	<1	<1	<1	93	80	<1	NA	<1	<1	<1
VOC 8260														
Benzene	1	1	5	<1	NA	NA	NA	18	18	NA	<1	<1	<1	<1

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Deactivated Landfill (LF01)
Matrix: Surface Water
Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples						Field Blanks			Lab Blanks
					SW01	SW02	SW03	SW04 & SW08 (Duplicates)		SW05	AB01	EB02	TB02	
Laboratory Sample ID Numbers					559/592	560/597	561/598	562/601 4358-1 4356-10	566/613 4356-11 4358-4	563/604	4356-5	557/572 4356-2	569 4356-1	#5-82793 4356 4358
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Dichlorodifluoro-methane	1	1		<1	NA	NA	NA	33	34	NA	<1	<1	<1	<1
cis-1,2-Dichloroethene	1	1	70	<1	NA	NA	NA	6.5	6.9	NA	<1	<1	<1	<1
Ethylbenzene	1	1	700	<1	NA	NA	NA	4.0	4.1	NA	<1	<1	<1	<1
p-Isopropyltoluene	1	1		<1	NA	NA	NA	1.7	1.7	NA	<1	<1	<1	<1
Naphthalene	1	1		<1	NA	NA	NA	<1J	3.4J	NA	<1	<1	<1	<1
Tetrachloroethene	1	1	5	<1	NA	NA	NA	84	82	NA	<1	<1	<1	<1
Toluene	1	1	1,000	<1	NA	NA	NA	7.3	7.2	NA	<1	<1	<1	<1
Trichloroethene	1	1	5	<1	NA	NA	NA	3.3	3.3	NA	<1	<1	<1	<1
Trichloro-fluoromethane	1	1		<1	NA	NA	NA	3.0	2.9	NA	<1	<1	<1	<1
1,2,4-Trimethylbenzene	1	1		<1	NA	NA	NA	<1	10	NA	<1	<1	<1	<1
1,3,5-Trimethylbenzene	1	1		<1	NA	NA	NA	<1	6.7	NA	<1	<1	<1	<1
Xylenes (Total)	2	2	10,000	<2	NA	NA	NA	21.7	21.7	NA	<2	<2	<2	<2
SVOC 8270	10	11-17		<20-<31	NA	NA	NA	<17	<11	NA	NA	<25	NA	<10
Pesticides	0.02-1	0.2-10		<0.2J-<50J	NA	NA	NA	<0.2J-<10J	<0.2J-<10J	NA	NA	<0.2J-<10J	NA	NA
PCBs	0.2	2	0.5	<2	<2	<2	<2	<2	<2	<2	NA	<2	NA	<2J
TOC	5,000	5,000		31,700-40,000	NA	NA	NA	17,800	20,400	NA	NA	NA	NA	<5,000

□ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Deactivated Landfill (LF01)
Matrix: Surface Water
Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples						Field Blanks			Lab Blanks
					SW01	SW02	SW03	SW04 & SW08 (Duplicates)		SW05	AB01	EB02	TB02	
Laboratory Sample ID Numbers					559/592	560/597	561/598	562/601 4358-1 4356-10	566/613 4356-11 4358-4	563/604	4356-5	557/572 4356-2	569 4356-1	4356 4358
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
TSS	100	200		6,000-77,000	NA	NA	NA	96,000	84,000	NA	NA	NA	NA	<200
TDS	10,000	10,000		149,000-151,000	NA	NA	NA	808,000	870,000J	NA	NA	NA	NA	<10,000

☐ CT&E Data.
NA Not analyzed.
J Result is an estimate.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Deactivated Landfill (LF01)
Matrix: Surface Water
Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples					Field Blanks			Lab Blanks
					SW06	SW07				AB01	EB02	TB02	
Laboratory Sample ID Numbers					564/609	565/612				4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L				µg/L	µg/L	µg/L	µg/L
DRPH	100	1,000		<1,000^{b}	<1,000J^{b}	<1,000J^{b}				NA	<1,000^{b}	NA	<1,000
GRPH	10	100		<50J^{b}	<100J^{b}	<100J^{b}				NA	<100J^{b}	<100J^{b}	<100J
RRPH (Approx.)	200	2,000		<2,000	<2,000	<2,000				NA	<2,000	NA	<2,000
BTEX (8020/8020 Mod.)													
Benzene	0.1	1	5	<1	<1	<1				<1^{c}	<1	<1	<1
Toluene	0.1	1	1,000	<1	<1	<1				<1^{c}	<1	<1	<1
Ethylbenzene	0.1	1	700	<1	<1	<1				<1^{c}	<1	<1	<1
Xylenes (Total)	0.2	2	10,000	<2	<2	<2				<2^{c}	<2	<2	<2
HVOC 8010	0.1	1		<1	<1	<1				NA	<1	<1	<1
PCBs	0.2	2	0.5	<2	<2	<2				NA	<2	NA	<2J

□ CT&E Data.
▒ F&B Data.
NA Not analyzed.
J Result is an estimate.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Deactivated Landfill (LF01)

Matrix: Surface Water
Units: μg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples					Field Blanks			Lab Blanks
					2SW09	2SW10				AB01	2EB03	2TB03	
Laboratory Sample ID Numbers					4692-9	4692-10				4356-5	4692-17	4692-16	4356 4692
ANALYSES	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L				μg/L	μg/L	μg/L	μg/L
DRPH	100	100		<1,000[b]	181[ad]	240[ad]				NA	NA	NA	<100
GRPH	20	20		<50J[b]	223[a]	<20				NA	NA	NA	<20
VOC 8260													
Benzene	1	1	5	<1	13	1.1				<1	<1	<1	<1
Chloromethane	1	1		<1	3.5B	8.3B				<1	3.1U	3.1U	1.09
cis-1,2-Dichloroethene	1	1	70	<1	5.5B	<1				<1	4.6	1.5	<1
Dichlorodifluoromethane	1	1		<1	58	<1				<1	<1	<1	<1
Ethylbenzene	1	1	700	<1	3.6	<1				<1	<1	<1	<1
p-Isopropyltoluene	1	1		<1	1.3	<1				<1	<1	<1	<1
Methylene Chloride	1	1	5	<1	2.6B	<1				3.1	3.4	2.8	<1
Tetrachloroethene	1	1	5	<1	109	<1				<1	<1	<1	<1
Toluene	1	1	1,000	<1	8.9	<1				<1	<1	<1	<1
Trichloroethene	1	1	5	<1	2.9B	<1				<1	1.7	<1	<1
Trichlorofluoromethane	1	1		<1	3.8	<1				<1	<1	<1	<1

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
B The analyte was detected in the associated blank.
J Result is an estimate.
U Compound is not present above the concentration listed.
a Total petroleum hydrocarbons in these water samples exceed the 15 μg/L stated for fresh water in ADEC's Water Quality Criteria 18AAC70 (ADEC 1989).
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
d The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Deactivated Landfill (LF01)

Matrix: Surface Water
Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples					Field Blanks			Lab Blanks
					2SW09	2SW10				AB01	2EB03	2TB03	
Laboratory Sample ID Numbers					4692-9	4692-10				4356-5	4692-17	4692-16	4356 4692
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L				µg/L	µg/L	µg/L	µg/L
1,2,4-Trimethylbenzene	1	1		<1	9.3	<1				<1	<1	<1	<1
1,3,5-Trimethylbenzene	1	1		<1	5.1	<1				<1	<1	<1	<1
Xylene	2	2		<2	2.07	<2				<2	<2	<2	<2

☐ CT&E Data.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Deactivated Landfill (LF01)
Matrix: Surface Water
Units: µg/L
METALS ANALYSES: TOTAL
(DISSOLVED)

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Samples						Field Blank			Lab Blanks
					SW04 & SW08 (Duplicates)							EB02		
Laboratory Sample ID Numbers					4358-1 4356-10	4358-4						4356-2		4358 4356
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L						µg/L		µg/L
Aluminum	17.4	100		<100-350 (<100-340)	180 (<100)	<100 (<100)						<100 (<100)		≤100
Antimony	N/A	100	6	<100 (<100)	<100 (<100)	<100 (<100)						<100 (<100)		<100
Arsenic	5.3	100	50	<100 (<100)	<100 (<100)	<100 (<100)						<100 (<100)		<100
Barium	1.2	50	2,000	<50-93 (<50-91)	210 (320)	200 (210)						<50 (<50)		<50
Beryllium	N/A	50	4	<50 (<50)	<50 (<50)	<50 (<50)						<50 (<50)		<50
Cadmium	1.7	50	5	<50 (<50)	<50 (<50)	<50 (<50)						<50 (<50)		<50
Calcium	34.5	200		4,500-88,000 (4,100-86,000)	81,000 (81,000)	83,000 (83,000)						410 (<200)		<200
Chromium	3.29	50	100	<50 (<50)	<50 (<50)	<50 (<50)						<50 (<50)		<50
Cobalt	N/A	100		<100 (<100)	<100 (<100)	<100 (<100)						<100 (<100)		<100
Copper	2.3	50	1,300	<50 (<50)	<50 (<50)	<50 (<50)						<50 (<50)		<50
Iron	25	100		180-2,800 (<100-1,600)	32,000 (22,000)	33,000 (23,000)						<100 (<100)		<100

☐ CT&E Data.
N/A Not available.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay   Matrix: Surface Water   METALS ANALYSES: TOTAL (DISSOLVED)
Site: Deactivated Landfill (LF01)   Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Samples						Field Blank			Lab Blanks
					SW04 & SW08 (Duplicates)							EB02		
Laboratory Sample ID Numbers					4358-1 4356-10	4358-4						4356-2		4358 4356
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L						µg/L		µg/L
Lead	6.6	100	15	<100 (<100)	<100 (<100)	<100 (<100)						<100 (<100)		<100
Magnesium	47.8	200		<5,000-53,000 (2,600-54,000)	25,000 (25,000)	25,000 (25,000)						<200 (<200)		<200
Manganese	1.24	50		<50-510 (<50-210)	940 (930)	960 (960)						<50 (<50)		<50
Molybdenum	N/A	50		<50 (<50)	<50 (<50)	<50 (<50)						<50 (<50)		<50
Nickel	5.5	50	100	<50 (<50)	<50 (<50)	<50 (<50)						<50 (<50)		<50
Potassium	1,154	5,000		<5,000 (<5,000)	8,000 (8,200)	8,100 (8,300)						<5,000 (<5,000)		<5,000
Selenium	62.4	100	50	<100 (<100)	<100 (<100)	<100 (<100)						<100 (<100)		<100
Silver	2.6	50	50	<50 (<50)	<50J (<50)J	<50J (<50)J						<50 (<50)		<50
Sodium	27.7	250		8,400-410,000 (8,200-450,000)	47,000 (49,000)	47,000 (47,000)						370 (400)		<250
Thallium	0.57	5	2	<5 (<5)	<5 (<5)	<5 (<5)						<5 (<5)		<5
Vanadium	1.8	50		<50 (<50)	<50 (<50)	<50 (<50)						<50 (<50)		<50

☐ CT&E Data.
N/A Not available
J Result is an estimate.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Deactivated Landfill (LF01)

Matrix: Surface Water
Units: μg/L

METALS ANALYSES: TOTAL
(DISSOLVED)

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Samples						Field Blank			Lab Blanks
					SW04 & SW08 (Duplicates)							EB02		
Laboratory Sample ID Numbers					4358-1 4356-10	4358-4						4356-2		4358 4356
ANALYSES	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L						μg/L		μg/L
Zinc	8.2	50		<50-160 (<50)	<50 (60)	<50 (<50)						<50 (<50)		<50

☐ CT&E Data.

TABLE 3-2. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE DEACTIVATED LANDFILL (LF01)

SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM CONCENTRATION	UNITS	BACKGROUND RANGE	RBSL[a]		ARAR[b]	CHEMICAL OF CONCERN
						CANCER	NON-CANCER		
Deactivated Landfill	Sediment	DRPH	624	mg/kg	<50-<100	--	--	500[c]	**Yes**
(LF01)		GRPH	11.9	mg/kg	<3J-<4J	--	--	100[c]	No
		Toluene	0.042	mg/kg	<0.030-<0.150	--	5,400	--	No
		Ethylbenzene	0.054	mg/kg	<0.030-<0.150	--	2,700	--	No
		Xylenes (total)	0.724	mg/kg	<0.030-<0.150	--	54,000	--	No
		Benzyl alcohol	1.38	mg/kg	<6.9-<15.0	--	8,100	--	No
		p-Isopropyltoluene	0.067	mg/kg	<0.030-<0.150	--	--	--	**Yes***
		Naphthalene	0.409	mg/kg	<0.030-<0.150	--	1,100	--	No
		Tetrachloroethene	0.727	mg/kg	<0.030-<0.150	1.23	270	--	No
		1,2,4-Trimethylbenzene	0.552	mg/kg	<0.030-<0.150	--	--	--	**Yes***
		1,3,5-Trimethylbenzene	0.342	mg/kg	<0.030-<0.150	--	--	--	**Yes***
		Aluminum	2,400	mg/kg	1,500-25,000	--	--	--	No
		Barium	260	mg/kg	27-390	--	1,890	--	No
		Calcium	6,300	mg/kg	360-59,000	--	--	--	No
		Chromium	13	mg/kg	<4.3-47	--	135	--	No
		Copper	55	mg/kg	<2.7-45	--	999	--	No
		Iron	70,000	mg/kg	5,400-35,000	--	--	--	No
		Lead	18	mg/kg	<5.1-22	--	--	500[d]	No
		Magnesium	1,900	mg/kg	360-7,400	--	--	--	No
		Manganese	220J	mg/kg	25-290	--	3,780	--	No
		Nickel	13	mg/kg	4.2-46	--	540	--	No
		Potassium	280	mg/kg	<300-2,200	--	--	--	No
		Sodium	120	mg/kg	<160-680	--	--	--	No

TABLE 3-2. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE DEACTIVATED LANDFILL (LF01) (CONTINUED)

SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM CONCENTRATION	UNITS	BACKGROUND RANGE	RBSL[a]		ARAR[b]	CHEMICAL OF CONCERN
						CANCER	NON-CANCER		
Deactivated Landfill	Sediment	Vanadium	11	mg/kg	6.3-59	--	189	--	No
(LF01)	(Continued)	Zinc	380	mg/kg	9.2-95	--	8,100	--	No
(Continued)	Surface Water[j]	DRPH	240	µg/L	<1,000	--	292	--	No
		GRPH	223	µg/L	<50J	50	730	--	**Yes**
		Benzene	23	µg/L	<1	0.617	--	5[c]	**Yes**
		Toluene	9	µg/L	<1	--	96.5	1,000[e]	No
		Ethylbenzene	13J	µg/L	<1	--	158	700[e]	No
		Xylenes (total)	21.7	µg/L	<2	--	7,300	10,000[e]	No
		Dichlorodifluoromethane	58	µg/L	<1	--	51.7	--	**Yes**
		cis-1,2-Dichloroethene	6.9	µg/L	<1.0	--	36.5	70[e]	No
		p-Isopropyltoluene	1.7	µg/L	<1	--	--	--	**Yes***
		Naphthalene	3.4J	µg/L	<1	--	150	--	No
		Tetrachloroethene	109	µg/L	<1	0.143	36.5	5[e]	**Yes**
		Trichloroethene	3.3	µg/L	<1	0.25	--	5[f]	**Yes**
		Trichlorofluoromethane	3.8	µg/L	<1	--	165	--	No
		1,2,4 Trimethylbenzene	10	µg/L	<1	--	--	--	**Yes***
		1,3,5 Trimethylbenzene	6.7	µg/L	<1	--	--	--	**Yes***
		Aluminum	180	µg/L	<100-350	--	--	--	No
		Barium	210	µg/L	<50-93	--	256	2,000[h]	No
		Calcium	83,000	µg/L	4,500-88,000	--	--	--	No
		Iron	33,000	µg/L	180-2,800	--	--	--	No
		Magnesium	25,000	µg/L	<5,000-53,000	--	--	--	No

TABLE 3-2. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE DEACTIVATED LANDFILL (LF01) (CONTINUED)

SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM CONCENTRATION	UNITS	BACKGROUND RANGE	RBSL[a]		ARAR[b]	CHEMICAL OF CONCERN
						CANCER	NON-CANCER		
Deactivated Landfill	Surface Water[i]	Manganese	960	µg/L	<50-510	--	18.3	--	**Yes**
(LF01)	(Continued)	Potassium	8,100	µg/L	<5,000	--	--	--	No
(Continued)		Sodium	47,000	µg/L	8,400-410,000	--	--	--	No

* The COCs selected for the site do not include metals that are considered essential human nutrients or analytes that do not have an RBSL or ARAR; however, these chemicals were discussed in the Point Lay Risk Assessment (U.S. Air Force 1996).

a Risk-Based Screening Level.

b Applicable or Relevant and Appropriate Requirement.

c ADEC 1991.

d EPA 1991c.

e MCL, 56 FR 3526 (30 January 1991).

f MCL, 52 FR 25690.

g 57 FR 31776 (17 July 1992).

h MCL, 56 FR 30266 (01 January 1991).

i The concentrations reported for metals in surface water are total metals.

B The analyte was detected in the associated blank.

J Result is an estimate.

3.2 GARAGE (SS06)

3.2.1 Site Background

The Garage (SS06) site is located approximately 250 feet north of the module train. The Garage is an approximately 90 feet by 40 feet building elevated about 5 feet above the tundra and is surrounded by gravel on the north, east, and south sides. The building is used for vehicle maintenance and storage.Floor drains in this building discharged directly to the tundra beneath the structure and may have received vehicle maintenance waste. The floor drains were sealed by the Air Force in July 1993 to prevent the possibility of future release of contaminants.

The site-specific environmental setting describing the topography, surface water drainage, and soil types is presented in the discussion of potential migration pathways, Section 3.2.3.

3.2.2 Field Sampling and Analytical Results

This section describes the RI sampling and analytical results for samples collected at the Garage (SS06) site. The discussion presents a review of laboratory data, data summary tables, contaminants identified, contaminant trends, and information on suspected source areas.

3.2.2.1 Summary of Samples Collected. A total of 24 samples was collected during the RI from gravel pads, tundra, ponds, and streams at the site. These consisted of 14 soil, 7 sediment, and 3 surface water samples. Table 2-2 presents a detailed summary of the samples collected and the analyses performed during the 1993 RI field activities. Locations of all samples collected at the Garage (SS06) site are presented in Figure 3-2.

Fourteen soil samples were analyzed for DRPH and GRPH. In addition, 13 samples were analyzed for BTEX. Nine samples were analyzed for RRPH, HVOCs, and PCBs, and three samples were analyzed for VOCs and SVOCs. Two samples were analyzed for total metals.

Seven sediment samples were analyzed for DRPH, GRPH, and BTEX. In addition, four samples were analyzed for RRPH, HVOCs, and PCBs. Three samples were analyzed for VOCs and SVOCs.

Three surface water samples were analyzed for DRPH, GRPH, RRPH, and BTEX. In addition, two samples were analyzed for HVOCs. One sample was analyzed for VOCs, SVOCs, and total and dissolved metals.

3.2.2.2 Analytical Results. The data summary table (Table 3-3) presents analytical results for all samples collected at the site. Detection and quantitation limits, action levels, associated laboratory and field blanks, and background analytical results are presented for each of the analyses. Background levels are listed to allow direct comparison of naturally occurring organic compounds and inorganic analytes with samples collected from the site. Sample locations and analytical results for the samples at the site are illustrated in Figure 3-2. All organic compounds detected are presented on the figure except when they were a result of laboratory contamination or decontamination procedures. Only metals detected above background levels

that exceed an RBSL or ARAR are presented on Figure 3-1. The exceptions are presented on the data summary table.

The following section presents a discussion of organic compounds and inorganic analytes detected above background levels at the site.

Organics. Organic compounds detected in soil and sediment samples at the site include DRPH, GRPH, RRPH, BTEX compounds, and ten other VOCs. DRPH were detected in 16 soil/sediment samples ranging from 4.61 to 33,400 mg/kg. GRPH were detected in 14 samples ranging from 0.607 to 937 mg/kg. RRPH were detected in five samples ranging from 620 to 40,000 mg/kg. BTEX compounds were detected in 11 soil/sediment samples. Total BTEX ranged from 0.031 to 60 mg/kg; xylenes were the primary component. Ten other VOCs were detected in six soil/sediment samples at concentrations ranging from 0.021 to 43 mg/kg. The primary VOC detected was tetrachloroethene (43 mg/kg).

In surface water samples collected from the site, organic compounds detected are limited to two VOCs. The two VOCs (naphthalene and 1,3,5-trimethylbenzene, both common components of diesel fuel) were detected at low levels (2.1 and 1.2 μg/L, respectively).

Inorganics. In soils, metals analyses indicated that two metals (chromium and lead) were detected above background levels at the site. Chromium was detected at 54 mg/kg (sample SS06-S08), and lead was detected at 92 and 195 mg/kg (samples SS06-S03 and SS06-S08, respectively).

In surface water samples, three metals (barium, iron, and manganese) were detected above background concentrations.

3.2.2.3 Summary of Site Contamination. The primary contaminants at the site are petroleum hydrocarbons (DRPH, GRPH, and RRPH), VOCs commonly associated with diesel fuel, and solvents. The suspected source of contaminants detected during sampling conducted at the Garage site is POL wastes discharged to the building floor drains and from previous spills and/or leaks. The drains were sealed by the Air Force in 1993 to prevent further release of contaminants. No previous IRP sampling is known to have been conducted at the site. The human health and ecological risks associated with the chemicals detected at the site are presented in Sections 3.2.4 and 3.2.5. Based on field data, source of contamination, and concentrations of contaminants, the area of affected media includes approximately 300 square feet of gravel, approximately 27,700 square feet of tundra, and approximately 4,000 square feet of soil underneath the building.

3.2.3 Migration Pathways

This section describes the topography and stratigraphy of the site and the migration potential of contaminants from the site. A discussion of receptors and chemical concentrations at receptors is included.

3.2.3.1 Topography and Stratigraphy. The natural topography in this area slopes gently to the west but is generally flat. Gravel pads and roads are the most significant topographic features at the site. The gravel pad adjacent to the Garage is approximately seven feet above natural grade, and roads range from approximately three to seven feet above natural grade. The most prominent drainage feature in the area is a small stream that begins just west of the garage, which flows west through a culvert under a road and into the tundra.

During the 1993 RI, permafrost was located at a depth of up to six feet under the gravel pads and at a depth of two feet under tundra areas. Gravel pads consisted of the typical gravels and sands associated with these features, and subsurface tundra materials were of the typical stratigraphy found at Point Lay (Section 2.4.4.2).

3.2.3.2 Migration Potential.

Subsurface Migration. Analytical data indicate that soil and sediments at the site have been contaminated with DRPH, GRPH, BTEX, and VOCs. Although surface water samples collected from these features during the RI were not significantly contaminated, the presence of contaminated sediments suggests that contaminated surface water has previously affected these features. The sediment samples were collected from soggy tundra areas (without a defined stream) and a small stream that infiltrates into the tundra. Surface water in these features may drain into the subsurface, and any contaminated water that may have been present may have entered the active layer. This suggests a potential for subsurface migration of contaminants to occur at the site. The local topography indicates that drainage in the active layer is westward towards Kasegaluk Lagoon, located approximately 850 feet west of the garage building.

Surface Migration. Analytical data indicate that the small stream which drains the Garage site has been contaminated with DRPH, GRPH, BTEX, and VOCs. Because this stream infiltrates into the tundra near the western border of the site, the stream is probably limited to onsite migration of contaminants. Offsite migration in surface water is probably restricted to the spring thaw, when an abundant supply of meltwater and reduced infiltration may increase the flow in this stream. Based on these considerations, the potential for offsite contaminant migration in surface water is considered to be limited. The presence of petroleum compounds (DRPH, GRPH, and RRPH) in the tundra north of the Garage (i.e., sample SS06-2SD05, Figure 3-2) indicates that petroleum hydrocarbons have migrated from the Garage to the tundra immediately north. Subsurface migration from the Garage is limited because the elevation of the gravel pad causes a dike effect (Figure 2-6). Drainage in the tundra immediately north of the Garage is sluggish because of the flat topography, as indicated by the analytical data, and the potential for migration of contaminants from the affected tundra is considered to be minimal.

Air Transport. Air transportation is not considered to be a significant mode of migration at the site (Section 2.4.4.5).

Summary of Migration Potential. Analytical data for the site suggest that some onsite migration of contaminants has occurred. Because the only stream that drains the Garage area infiltrates into the subsurface before leaving the site, the potential for offsite migration in surface water is considered to be limited. Offsite migration in surface water is probably limited to the spring thaw.

The migration of contaminants in the subsurface is possible; however, the movement of active zone water in the area is sluggish.

3.2.3.3 Receptors and Chemical Concentrations at Receptors.

Human Receptors. Potential human receptors at the Garage site include Air Force contractor personnel working at the station, visitors to the station, and an occasional local visitor passing the site to get to recreational or subsistence lands. Human receptors could potentially be exposed to the chemicals detected in surface water and soil/sediments at the site. The primary routes of potential exposures at the site are direct contact with soil/sediment, incidental ingestion of soil/sediment, and ingestion of surface water. Because ground water and air at the Point Lay sites are not considered complete pathways of exposure, these media are not evaluated as potential pathways to human receptors.

The Point Lay Risk Assessment (U.S. Air Force 1996) evaluates in detail the risks to human health from all COCs detected at the site. The potential receptor groups were selected based on their likelihood of exposure to contaminants at the site and include DEW Line workers at the installation, and native adults and children who may visit the site. The estimated exposure point concentrations for human receptors are based on the maximum concentration of each chemical detected at the site. The potential risks to human health associated with chemicals at Point Lay are presented in Section 3.2.4.

Ecological Receptors. Ecological receptors were evaluated in detail in the Point Lay Risk Assessment (U.S. Air Force 1996) to determine if plants and animals could potentially be impacted by the chemicals detected at the Point Lay installation. Because of the diversity of the plants and animals in the area of the Point Lay installation, a set of representative species was selected in the ERA for detailed evaluation. The species include plants, aquatic invertebrates, fish, birds, and mammals. These receptors were selected based on the species' likelihood of exposure given their preferred habitat and feeding habits. The representative species encompass a range of ecological niches in order to achieve the best characterization of the ecosystems being examined and are presented in Table 2-6.

The estimate of chemical concentrations at the ecological receptors was based on the average site-wide concentration of each COC. This approach was appropriate because few of the representative species would inhabit only one distinct site at the installation; they are more likely to be exposed to the mix of chemicals and concentrations detected on all the sites at Point Lay. The potential ecological risks associated with the chemicals detected at the site are presented in Section 3.2.5.

3.2.4 Human Health Risk Assessment

This section presents a summary of the potential human health risks associated with the chemicals detected at the Garage (SS06) site. The purpose of the human health risk assessment is to quantify the excess lifetime cancer risk and/or the noncancer hazard (reported as hazard index) from the chemicals detected at the site.

This summary presents the COCs at the site, the pathways by which human receptors may be exposed to site chemicals, potential risks to human health posed by each chemical through each exposure pathway, the significance of the risk and/or hazard estimate, and a comparison of site chemical concentrations to ARARs. The methods and assumptions used in calculating hazards and risks are presented in Section 2.4.1.

3.2.4.1 Chemicals of Concern. At the Garage (SS06), COCs identified for the soil/sediment matrix included DRPH, RRPH, GRPH, trichloroethane, and tetrachloroethene. The maximum concentrations of DRPH, GRPH, and RRPH exceeded the background concentrations and the ARAR concentrations for petroleum hydrocarbon contamination of soil (ADEC 1991). Tetrachloroethene exceeded the background concentration and the RBSL based on cancer risk.

Barium and manganese were identified as a COC for the surface water at the Garage. Barium exceeded the RBSL based on noncancer hazard but did not exceed the ARAR which is an MCL promulgated under the federal Safe Drinking Water Act. Manganese exceeded the background concentration and the RBSL based on noncancer hazard.

Table 3-4, Identification of COCs at the Garage, presents the maximum concentrations of chemicals detected at the site, the associated background concentrations, RBSLs, and ARARs, and identifies COCs selected in the risk evaluation.

3.2.4.2 Exposure Pathways and Potential Receptors. Because COCs were identified for soil/sediment and surface water at the site, the potential risks associated with ingestion of soil/sediment and surface water were evaluated in the risk assessment.

Three potential receptor groups were evaluated in the risk assessment: an adult assigned to a DEW Line installation (worker), an adult inhabitant of communities in the North Slope of Alaska (native), and a child living in a North Slope community (child).

3.2.4.3 Risk Characterization.

Noncancer Hazard and Cancer Risk Associated with Soils and Sediments. The noncancer hazard associated with the ingestion of soil at the Garage by a hypothetical native northern adult/child is 1.1, and by a DEW Line worker is 0.05, based on the maximum concentrations of the COCs. The presence of DRPH, GRPH, RRPH, trichloroethane, and tetrachloroethene entirely accounts for the quantifiable noncancer hazard for these receptor/pathway combinations. DRPH and RRPH together account for more than 90 percent of the noncancer hazard.

The excess lifetime cancer risk associated with the ingestion of soil or sediment at this site by a hypothetical native northern adult/child is 7×10^{-7}, and by a DEW Line worker is 3×10^{-8}, based on the maximum concentrations of the COCs. The presence of GRPH, trichloroethane, and tetrachloroethene entirely accounts for the quantifiable excess lifetime risk for these receptor/pathway combinations.

Noncancer Hazard and Cancer Risk Associated with Surface Water. The noncancer hazard associated with the ingestion of surface water at the Garage by a hypothetical native northern

adult or by a DEW Line worker is 4.9, based on the maximum concentrations of the COC. Manganese and barium account for the quantifiable noncancer hazard for these receptor/pathway combinations. Manganese alone accounts for 99 percent of the noncancer hazard.

No carcinogenic COCs were identified for the surface water at this site; therefore, the excess lifetime cancer risk associated with ingestion of surface water cannot be quantified.

3.2.4.4 Summary of Human Health Risk Assessment. The potential risks and hazards associated with the soil/sediment at the Garage site are the low noncancer hazard (hazard indices of 1.1 and 0.05), and very low cancer risk associated with GRPH and tetrachloroethene. These risks and hazards were calculated conservatively based on ingestion of soil at a rate associated with a residential scenario. It is very unlikely that the soil at this location would be ingested at the conservative rate used in the risk calculation, and the hazards and risks at the site are likely to be overestimated. Remedial action is generally not warranted at sites where the excess lifetime cancer risk is less than 1×10^{-4} or the noncancer hazards do not significantly exceed one, and on the basis of the risk assessment remediation of the site is not necessarily warranted.

The potential hazards associated with the surface water at the Garage site are the low hazard indices of 4.9 for both the native northern adult and a DEW Line worker. The noncancer hazard is associated with the levels of manganese and barium detected in surface water. The noncancer hazards in surface water were calculated assuming the affected surface water would be used as a sole-source water supply for 180 days per year. Based on site-specific information, the above mentioned chemicals detected in surface water do not currently pose a health hazard nor are they likely to pose a hazard in the future. The surface water expressions at the site are frozen most of the year; many are only intermittently filled with water during the summer months. The surface water at the site is not known to be used as a water supply now, nor has it been used in the past.

In conclusion, under current uses the COCs identified in soil/sediment and surface water at the Garage site pose only a minimal, if any, potential threat to human health. Based on the human health risk assessment, remedial actions are not warranted at the site. In the unlikely event that surface water at the site is used as a sole-source drinking water supply in the future, a potential noncancer hazard to human health could exist if current conditions remain constant.

3.2.5 Ecological Risk Assessment

The objective of the ERA is to estimate the potential impacts of chemicals detected at the installation on aquatic and terrestrial plants and animals. A summary of the methods used to assess potential ecological impacts is presented in Section 2.4.2.

3.2.5.1 Chemicals of Concern. COCs were selected based on criteria presented in Section 3.1 of the ERA. The average installation-wide concentration of COCs were used to calculate the risk assessments. All sites at the installation were considered to be potentially usable habitat. It should be noted that the COC selection process only considered the

soil/sediment samples that were at or less than 1.5 feet deep. The soil/sediment samples were screened for depth because it is unlikely that any of the representative species will be exposed to soils/sediments deeper than 1.5 feet. Iron and manganese were identified as COCs in surface water, and the COCs in soil/sediments at the Garage site were DRPH, GRPH, RRPH, BTEX, tetrachloroethene, trichloroethane, trichloroethene, lead, and zinc. None of the identified COCs was associated with significant risk estimates at the Garage site.

3.2.5.2 Summary of Ecological Risk Assessment. Based on the quantification of potential risks to ecological receptors and discussions presented in the Point Lay ERA, ecological risks at the Garage site are minimal.

3.2.6 Conclusions and Recommendations

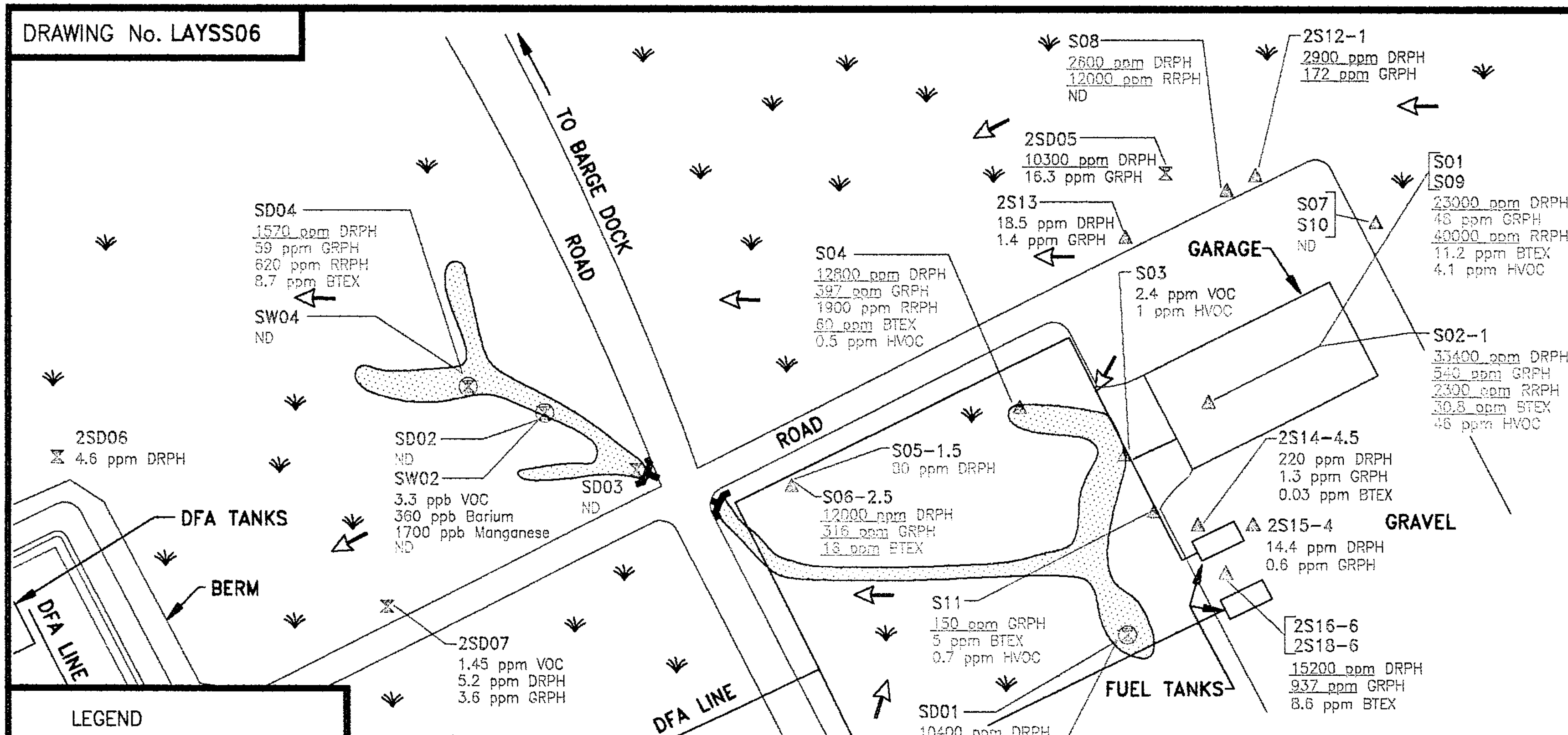
Sampling and analyses have determined that the Garage (SS06) site is contaminated with petroleum hydrocarbons (DRPH, GRPH, and RRPH), BTEX compounds, other VOCs that are components of diesel fuel, and solvents. The contaminated areas at the site are soil/sediment and surface water. The area beneath the Garage has the highest concentrations of affected soil. Contaminant concentrations decrease with distance from the Garage. The suspected source of contamination is POL wastes previously discharged to the building floor drains.

Migration of contaminants from the site appears to have occurred via surface and subsurface pathways from the gravel pad and the area below the Garage to the surrounding gravel and tundra areas.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current site uses. Under a future scenario, using the surface water in the drainage pathways from the site as a drinking water supply results in a low potential risk to human health. The human health risk, however, is not of a magnitude that normally requires remedial action. The ERA concluded that the overall potential risks presented by site contaminants are minimal. Therefore, under current and future site conditions and considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Levels of petroleum compounds (DRPH, GRPH, and RRPH) detected in soil/sediment at the site significantly exceed ADEC guidance cleanup levels. In addition, site contaminants have migrated downgradient and have impacted soil/sediment and surface water. Therefore, the site is being recommended for remedial action. The affected areas at the site include approximately 4,000 square feet beneath the building, approximately 300 square feet of gravel between the fuel tanks south of the Garage, and approximately 27,700 square feet of tundra located southwest of the Garage. The remedial action alternative recommended for the gravel between the fuel tanks, the soil beneath the building, and the tundra is enhanced bioremediation. A complete description and evaluation of the remedial alternatives recommended for this site are presented in the FS, Section 4.0.

THIS PAGE INTENTIONALLY LEFT BLANK



LEGEND

- BUILDINGS, STRUCTURES
- ROADS
- SOIL SAMPLE
- SEDIMENT SAMPLE
- SEDIMENT AND WATER SAMPLES
- TUNDRA
- SURFACE WATER
- CULVERT
- GRAVEL PAD BOUNDARY
- SURFACE DRAINAGE
- 2.6 ppm CT&E DATA
- 0.9 ppm F&B DATA
- POL PIPELINE

0000	CONCENTRATIONS ARE ABOVE ACTION LEVELS
ND	NO CONTAMINATION DETECTED
SVOC	TOTAL SEMI-VOLATILE ORGANIC COMPOUNDS
VOC	TOTAL VOLATILE ORGANIC COMPOUNDS
DRPH	DIESEL RANGE PETROLEUM HYDROCARBONS
GRPH	GASOLINE RANGE PETROLEUM HYDROCARBONS
RRPH	RESIDUAL RANGE PETROLEUM HYDROCARBONS
BTEX	TOTAL BTEX COMPOUNDS
HVOC	TOTAL HALOGENATED VOLATILE ORGANIC COMPOUNDS

POINT LAY RADAR INSTALLATION

USAF 611th CES

FIGURE NO. 3-2

GARAGE (SS06) SAMPLE LOCATIONS AND ANALYTICAL RESULTS

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY

Installation: Point Lay — Site: Garage (SS06) — Matrix: Soil — Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples: S01 & S09 (Replicates)		S02-1	S03	S04	S05-1.5	S06-2.5	Field Blanks: AB01	EB02	TB02	Lab Blanks	
Laboratory Sample ID Numbers					636	652	638	640 4354-4	642	644	646	4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356	#5-82593 #1&2-82593 4354
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	6	60	500[a]	<50[b]-<100[b]	23,000J[b]	18,000J[b]	33,400J[b]	<60[b]	12,800J[b]	80J[b]	12,000J[b]	NA	<1,000[b]	NA	<1,000	<50
GRPH	3.4-3.7	34-37	100	<3J[b]-<4J[b]	25J[b]	48J[b]	540J[b]	<37J[b]	397J[b]	<34J[b]	318J[b]	NA	<100J[b]	<100J[b]	<100R	<1J
RRPH (Approx.)	16-18	160-180	2,000[a]	<100	40,000	40,000	2,300	<180	1,900	<160	<160	NA	<2,000	NA	<2,000	<100
BTEX (8020/ 8020 Mod.)			10 Total BTEX	<0.13-<0.20	<0.10	11.2J	30.8J	<0.15	60	<4.0J	16J					
Benzene	0.002-0.05	0.02-0.5	0.5	<0.02-<0.04	<0.02	<0.03	<0.03	<0.03	<0.03	<0.5J	<0.4J	<1[c]	<1	<1	<1	<0.02
Toluene	0.002-0.05	0.02-0.5		<0.02-<0.04	<0.02	0.2	3	<0.03	4	<0.5	<0.4	<1[c]	<1	<1	<1	<0.02
Ethyl-benzene	0.002-0.2	0.02-2.0		<0.03-<0.04	<0.02	3	6.8	<0.03	14	<2.0J	<0.4J	<1[c]	<1	<1	<1	<0.02
Xylenes (Total)	0.004-0.1	0.04-1.0		<0.04-<0.08	<0.04	8J	21J	<0.06	42J	<1J	16J	<2[c]	<2	<2	<2	<0.04
HVOC 8010																
Tetrachlo-roethene	0.002-0.004	0.02-0.04		<0.03-<0.04	1.3J	0.1J	43J	1J	<0.03J	<0.03J	<0.04J	NA	<1	<1	<1	<0.02J
Trichloro-ethane	0.002-0.004	0.02-0.04		<0.03-<0.04	1.8J	<0.03J	1J	<0.03J	0.5J	<0.03J	<0.04J	NA	<1	<1	<1	<0.02J
Trichloro-ethene	0.002-0.004	0.02-0.04		<0.03-<0.04	1J	<0.03J	2J	<0.03J	<0.03J	<0.03J	<0.04J	NA	<1	<1	<1	<0.02J

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
R Result has been rejected.
a The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Matrix: Soil
Site: Garage (SS06) Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples								Field Blanks			Lab Blanks	
					S01 & S09 (Replicates)		S02-1	S03	S04	S05-1.5	S06-2.5	AB01	EB02	TB02		
Laboratory Sample ID Numbers					636	652	638	640 4354-4	642	644	646	4356-5	557/572 4356-2	569 4356-1	4358	4354
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
VOC 8260																
cis-1,2-Dichloro-ethene	0.020	0.020		<0.030-<0.150	NA	NA	NA	0.022J	NA	NA	NA	<1	<1	<1	<1	<0.020
p-Isopro-pyltoluene	0.020	0.020		<0.030-<0.150	NA	NA	NA	0.042J	NA	NA	NA	<1	<1	<1	<1	<0.020
Ethyl-benzene	0.020	0.020		<0.030-<0.150	NA	NA	NA	0.023J	NA	NA	NA	<1	<1	<1	<1	<0.020
Methylene Chloride	0.020	0.020	90	<0.030-<0.150	NA	NA	NA	0.023BJ	NA	NA	NA	3.1	2.3	12	<1	<0.020
Naph-thalene	0.020	0.020		<0.030-<0.150	NA	NA	NA	0.158J	NA	NA	NA	<1	<1	<1	<1	<0.020
Tetrachlor-oethene	0.020	0.020		<0.030-<0.150	NA	NA	NA	0.359J	NA	NA	NA	<1	<1	<1	<1	<0.20
Toluene	0.020	0.020		<0.030-<0.150	NA	NA	NA	0.094J	NA	NA	NA	<1	<1	<1	<1	<0.020
1,2,4-Tri-methyl-benzene	0.020	0.020		<0.030-<0.150	NA	NA	NA	0.315J	NA	NA	NA	<1	<1	<1	<1	<0.020
1,3,5-Tri-methyl-benzene	0.020	0.020		<0.030-<0.150	NA	NA	NA	0.497J	NA	NA	NA	<1	<1	<1	<1	<0.020
Xylenes (Total)	0.040	0.040		<0.060-<0.300	NA	NA	NA	0.849J	NA	NA	NA	<2	<2	<2	<2	<0.040
SVOC 8270	0.200	2.20		<6.9-<15.0	NA	NA	NA	<2.20	NA	NA	NA	NA	<25	NA	<10	<0.200

☐ CT&E Data.
NA Not analyzed.
B The analyte was detected in the associated blank.
J Result is an estimate.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay   Matrix: Soil
Site: Garage (SS06)   Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples							Field Blanks			Lab Blanks	
					S01 & S09 (Replicates)		S02-1	S03	S04	S05-1.5	S06-2.5	AB01	EB02	TB02		
Laboratory Sample ID Numbers					636	652	638	640 4354-4	642	644	646	4356-5	557/572 4356-2	569 4356-1	4356	4354
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
Pesticides	0.002-0.05	0.02-0.5		<0.02J-<0.5J	NA	NA	NA	<0.02J-<0.5J	NA	NA	NA	NA	<0.2J-<10J	NA	NA	<0.2J-<50J
PCBs	0.01-0.05	0.1-0.5	10	<0.1	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.2	NA	<2	NA	<2J	<0.1

▒ F&B Data.
NA Not analyzed.
J Result is an estimate.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Garage (SS06)
Matrix: Soil
Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples				Field Blanks			Lab Blanks	
					S07 & S10 (Replicates)		S08	S11	AB01	EB02	TB02		
Laboratory Sample ID Numbers					648	654	650 4354-5	656	4356-5	557/572 4356-2	569 4356-1	#3&4-82593 #5-82793 4356	#5-82593 #1&2-82593 4354
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	6-7	60-70	500[a]	<50[b]-<100[b]	<70[b]	<60[b]	2,600J[b]	<7,600J[b]	NA	<1,000[b]	NA	<1,000	<50
GRPH	0.5-4	5-40	100	<3J[b]-<4J[b]	<40J[b]	<52J[b]	<5J[b]	150J[b]	NA	<100J[b]	<100J[b]	<100J	<1J
RRPH (Approx.)	10	100	2,000[a]	<100	<160	<100	12,000	<100	NA	<2,000	NA	<2,000	<100
BTEX (8020/8020 Mod.)			10 Total BTEX	<0.13-<0.20	<2.4J	<2.4J	<0.15	5.0J					
Benzene	0.002-0.06	0.02-0.6	0.5	<0.02-<0.04	<0.6J	<0.6J	<0.03	<0.02	<1[c]	<1	<1	<1	<0.02
Toluene	0.002-0.06	0.02-0.6		<0.02-<0.04	<0.6	<0.6	<0.03	<0.02	<1[c]	<1	<1	<1	<0.02
Ethylbenzene	0.002-0.06	0.02-0.6		<0.03-<0.04	<0.6J	<0.6J	<0.03	1.1	<1[c]	<1	<1	<1	<0.02
Xylenes (Total)	0.004-0.06	0.04-0.6		<0.04-<0.08	<0.6J	<0.6J	<0.06	3.8J	<2[c]	<2	<2	<2	<0.04
HVOC 8010													
Trichloroethane	0.002-0.003	0.02-0.03		<0.03-<0.04	<0.03J	<0.03J	<0.03J	0.7J	NA	<1	<1	<1	<0.02J
VOC 8260	0.020	0.100		<0.030-<0.150	NA	NA	<0.100	NA	<1	<1	<1-12	<1	<0.020
SVOC 8270	0.200	2.20		<6.9-<15.0	NA	NA	<2.20	NA	NA	<25	NA	<10	<0.010
Pesticides	0.002-0.05	0.02-0.5		<0.02J-<0.5J	NA	NA	<0.02J-<0.5J	NA	NA	<0.2J-<10J	NA	NA	<0.02J-<0.5J
PCBs	0.01-0.02	0.1-0.2	10	<0.1	<0.1	<0.1	<0.2	<0.1	NA	<2	NA	<2J	<0.1

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
a The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Garage (SS06) — Matrix: Soil Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples						Field Blanks			Lab Blanks	
					2S12-1	2S13	2S14-4.5	2S15-4	2S16-6 & 2S18-6 (Replicates)		AB01	2EB03	2TB03		
Laboratory Sample ID Numbers					4693-14	4693-15	4693-16	4693-17	4693-18	4693-19	4356-5	4692-17	4692-16	4356 4692	4693
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	4.00	4.00	500[a]	<50[b]-<100[b]	2,900J[d]	18.5[e]	220[f]	14.4[e]	9,030[g]	15,200[h]	NA	NA	NA	NA	<4.00
GRPH	0.400	0.400	100	<3J[b]-<4J[b]	172	1.41	1.28	0.607	733	937	NA	NA	NA	NA	<0.400
BTEX (8020/8020 Mod.)			10 Total BTEX	<0.13-<0.20	NA	<0.125	0.031	<0.10	8.628	7.322					
Benzene	0.020	0.020	0.5	<0.02-<0.04	NA	<0.025	<0.020	<0.020	0.178	0.156	<1[c]	<1[c]	<1[c]	<1	<0.020
Toluene	0.020	0.020		<0.02-<0.04	NA	<0.025	<0.020	<0.020	1.56	0.856	<1[c]	<1[c]	<1[c]	<1	<0.020
Ethylbenzene	0.020	0.020		<0.03-<0.04	NA	<0.025	<0.020	<0.020	2.15	2.57	<1[c]	<1[c]	<1[c]	<1	<0.020
Xylenes (Total)	0.040	0.040		<0.04-<0.08	NA	<0.050	0.031	<0.040	4.74	3.74	<2[c]	<2[c]	<2[c]	<2	<0.040
VOC 8260	0.020	2.00		<0.030-<0.150	<2.00J	NA	NA	NA	NA	NA	<1	3.1U	3.1U	1.09	<0.020
SVOC 8270	0.200	2.20-2.79	8,000	<6.90-<15.0	<2.20-2.79U	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.200-2.31

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
U Compound is not present above the concentration listed.
a The action level for DRPH is based on conversations with ADEC; a final action level has not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.
d The laboratory reported that 2,500 mg/kg of the EPH pattern in this sample was not consistent with a middle distillate fuel.
e The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel.
f The laboratory reported that 55.8 mg/kg of the EPH pattern in this sample was not consistent with a middle distillate fuel.
g The laboratory reported that 4,630 mg/kg of the EPH pattern in this sample was not consistent with a middle distillate fuel.
h The laboratory reported that 6,530 mg/kg of the EPH pattern in this sample was not consistent with a middle distillate fuel.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Garage (SS06)
Matrix: Sediment
Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples				Field Blanks			Lab Blanks	
					SD01	SD02	SD03	SD04	AB01	EB02	TB02		
Laboratory Sample ID Numbers					470	472	474	476	4356-5	557/572 4356-2	569 4356-1	#3&4-82593 #5-82793	#5-82593 #1&2-82593
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	6	60	500[a]	<50[b]-<100[b]	10,400J[b]	<60[b]	<60[b]	1,570J[b]	NA	<1,000[b]	NA	<1,000	<50
GRPH	0.1	1	100	<3J[b]-<4J[b]	90J[b]	<1J[b]	<1J[b]	59J[b]	NA	<100J[b]	<100J[b]	<100J	<1J
RRPH (Approx.)	12	120	2,000[a]	<100	<120	<120	<120	620	NA	<2,000	NA	<2,000	<100
BTEX (8020/8020 Mod.)			10 Total BTEX	<0.13-<0.20	10.76J	<0.15	<0.15	8.7J					
Benzene	0.003	0.03	0.5	<0.02-<0.04	<0.03	<0.03	<0.03	0.3J	<1[c]	<1	<1	<1	<0.02
Toluene	0.003	0.03		<0.02-<0.04	0.16	<0.03	<0.03	0.9	<1[c]	<1	<1	<1	<0.02
Ethylbenzene	0.003	0.03		<0.03-<0.04	2.5	<0.03	<0.03	1.5	<1[c]	<1	<1	<1	<0.02
Xylenes (Total)	0.006	0.06		<0.04-<0.08	8.1J	<0.06	<0.06	6J	<2[c]	<2	<2	<2	<0.04
HVOC 8010	0.003-0.005	0.03-0.05		<0.03-<0.04	<0.03J	<0.03J	<0.03J	<0.05J	NA	<1	<1	<1	<0.02J
PCBs	0.01-0.03	0.1-0.3	10	<0.1	<0.1	<0.1	<0.1	<0.3	NA	<2	NA	<2J	<0.1

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
a The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Garage (SS06)

Matrix: Sediment
Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples			Field Blanks			Lab Blanks	
					2SD05	2SD06	2SD07	AB01	2EB03	2TB03		
Laboratory Sample ID Numbers					4693-11	4693-12	4693-13	4356-1	4692-17	4692-16	4356 4692	4693
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	4.00	4.00	500[a]	<50[b]-<100[b]	10,300[d]	4.61[d]	5.19J[d]	NA	NA	NA	NA	<4.00
GRPH	0.400	0.400	100	<3J[b]-<4J[b]	16.3	<0.500	3.64	NA	NA	NA	NA	<0.400
BTEX (8020/8020 Mod.)			10 Total BTEX	<0.13-<0.20	<2.5	<0.125	NA					
Benzene	0.020	0.025-0.500	0.5	<0.02-<0.04	<0.500	<0.025	NA	<1[c]	<1[c]	<1[c]	<1	<0.020
Toluene	0.020	0.025-0.500		<0.02-<0.04	<0.500	<0.025	NA	<1[c]	<1[c]	<1[c]	<1	<0.020
Ethylbenzene	0.020	0.025-0.500		<0.03-<0.04	<0.500	<0.025	NA	<1[c]	<1[c]	<1[c]	<1	<0.020
Xylenes (Total)	0.040	0.050-1.000		<0.04-<0.08	<1	<0.050	NA	<2[c]	<2[c]	<2[c]	<2	<0.040
VOC 8260												
Benzene	0.020	0.020	0.5	<0.030-<0.150	NA	NA	0.020J	<1	<1	<1	<1	<0.020
Ethylbenzene	0.020	0.020		<0.030-<0.150	NA	NA	0.085J	<1	<1	<1	<1	<0.020
Isopropylbenzene	0.020	0.020		<0.030-<0.150	NA	NA	0.022J	<1	<1	<1	<1	<0.020
p-Isopropyltoluene	0.020	0.020		<0.030-<0.150	NA	NA	0.021J	<1	<1	<1	<1	<0.020
Naphthalene	0.020	0.020		<0.030-<0.150	NA	NA	0.092J	<1	NA	NA	<1	<0.020

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
U Compound is not present above the concentration listed.
a The action level for DRPH are based on conversations with ADEC; A final action level HAS not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.
d The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Garage (SS06)

Matrix: Sediment
Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples			Field Blanks			Lab Blanks	
					2SD05	2SD06	2SD07	AB01	2EB03	2TB03		
Laboratory Sample ID Numbers					4693-11	4693-12	4693-13	4356-1	4692-17	4692-16	4356 4692	4693
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
n-Propylbenzene	0.020	0.020		<0.030-<0.150	NA	NA	0.068J	<1	<1	<1	<1	<0.020
Toluene	0.020	0.020		<0.030-<0.150	NA	NA	0.199J	<1	<1	<1	<1	<0.020
1,2,4-Trimethylbenzene	0.020	0.020		<0.030-<0.150	NA	NA	0.287J	<1	<1	<1	<1	<0.020
1,3,5-Trimethylbenzene	0.020	0.020		<0.030-<0.150	NA	NA	0.203J	<1	<1	<1	<1	<0.020
Xylenes (Total)	0.040	0.040		<0.060-<0.300	NA	NA	0.451J	<2	<2	<2	<2	<0.040
SVOC 8270	0.200	0.228		<6.9-<15.0	NA	NA	<0.228-2.88U	NA	NA	NA	NA	<0.200-2.31

☐ CT&E Data.
NA Not analyzed.
J Result is an estimate.
U Compound is not present above the concentration listed.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay   Matrix: Soil   METALS ANALYSES
Site: Garage (SS06)   Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Samples S03	Environmental Samples S08	Field Blank EB02	Lab Blanks
Laboratory Sample ID Numbers					4354-4	4354-5	4356-2	4356 4354
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L
Aluminum	0.35	2		1,500-25,000	2,300	2,100	<100	≤100
Antimony	N/A	50-63		<7.8-<230	<63J	<50	<100	<100
Arsenic	0.11	50-63		<4.9-8.5	<63	<50	<100	<100
Barium	0.024	1		27-390	290	280	<50	<50
Beryllium	N/A	25-32		<2.6-6.4	<32	<25	<50	<50
Cadmium	0.33	25-32		<3.0-<36	<32	<25	<50	<50
Calcium	0.69	4		360-59,000	2,000	1,500	410	<200
Chromium	0.066	1		<4.3-47	21	54	<50	<50
Cobalt	N/A	5.0-6.3		<5.1-12	<6.3	<5.0	<100	<100
Copper	0.045	25-32		<2.7-45	<32	<25	<50	<50
Iron	0.50	2		5,400-35,000	14,000	20,000	<100	<100
Lead	0.13	2		<5.1-22	92	195	<100	<100
Magnesium	0.96	4		360-7,400	1,300	1,200	<200	<200
Manganese	0.025	1		25-290	160J	270	<50	<50
Molybdenum	N/A	25-32		<2.5-<11	<32	<25	<50	<50
Nickel	0.11	1		4.2-46	16	12	<50	<50
Potassium	23	100		<300-2,200	430	410	<5,000	<5,000

☐ CT&E Data.
NA Not analyzed.
J Result is an estimate.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Garage (SS06)

Matrix: Soil
Units: mg/kg

METALS ANALYSES

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Samples						Field Blank			Lab Blanks
					S03	S08						EB02		
Laboratory Sample ID Numbers					4354-4	4354-5						4356-2		4356 4354
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg						µg/L		µg/L
Selenium	1.2	50-63		<7.8-<170	<63	<50						<100		<100
Silver	0.53	25-32		<3-<110	<32R	<25						<50		<50
Sodium	0.55	5		<160-680	250	81						370		<250
Thallium	0.011	0.27-0.31		<0.2-<1.2	<0.31	<0.27						<5		<5
Vanadium	0.036	1		6.3-59	13	12						<50		<50
Zinc	0.16	1		9.2-95	85	59						<50		<50

☐ CT&E Data.
NA Not analyzed.
R Result has been rejected.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Garage (SS06)
Matrix: Surface Water
Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples				Field Blanks			Lab Blanks
					SW01 & SW03 (Duplicates)		SW02	SW04	AB01	EB02	TB02	
Laboratory Sample ID Numbers					501 619	500/626	567/622 4356-12 4354-10 4358-5	499/616	4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4354 4356 4358
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DRPH	100	1,000		<1,000[b]	<1,000[b]	<1,000[b]	<1,000J[b]	<1,000[b]	NA	<1,000[b]	NA	<1,000
GRPH	10	100		<50J[b]	<100J[b]	<100J[b]	<100J[b]	<100J[b]	NA	<100J[b]	<100J[b]	<100J
RRPH (Approx.)	200	2,000		<2,000	<2,000	<2,000	<2,000	<2,000	NA	<2,000	NA	<2,000
BTEX (8020/8020 Mod.)												
Benzene	0.1	1	5	<1	<1	<1	<1	<1	<1[c]	<1	<1	<1
Toluene	0.1	1	1,000	<1	<1	<1	<1	<1	<1[c]	<1	<1	<1
Ethylbenzene	0.1	1	700	<1	<1	<1	<1	<1	<1[c]	<1	<1	<1
Xylenes (Total)	0.2	2	10,000	<2	<2	<2	<2	<2	<2[c]	<2	<2	<2
HVOC 8010	0.1	1		<1	<1	NA	<1	NA	NA	<1	<1	<1
VOC 8260												
Naphthalene	1	1		<1	NA	NA	2.1	NA	<1	<1	<1	<1
1,3,5-Trimethylbenzene	1	1		<1	NA	NA	1.2	NA	<1	<1	<1	<1
SVOC 8270	10	10		<20-<31	NA	NA	<10	NA	NA	<25	NA	<10

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Garage (SS06)

Matrix: Surface Water
Units: µg/L

METALS ANALYSES: TOTAL
(DISSOLVED)

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Sample						Field Blank			Lab Blanks
					SW02							EB02		
Laboratory Sample ID Numbers					4356-12 4354-10 4358-5							4356-2		4354 4356 4358
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L							µg/L		µg/L
Aluminum	17.4	100		<100-350 (<100-340)	<100 (<100)							<100 (<100)		<100 (<100)
Antimony	N/A	100	6	<100 (<100)	<100 (<100)							<100 (<100)		<100 (<100)
Arsenic	5.3	100	50	<100 (<100)	<100 (<100)							<100 (<100)		<100 (<100)
Barium	1.2	50	2,000	<50-93 (<50-91)	360 (340)							<50 (<50)		<50 (<50)
Beryllium	N/A	50	4	<50 (<50)	<50 (<50)							<50 (<50)		<50 (<50)
Cadmium	1.7	50	5	<50 (<50)	<50 (<50)							<50 (<50)		<50 (<50)
Calcium	34.5	200		4,500-88,000 (4,100-86,000)	52,000 (51,000)							410 (<200)		<200 (<200)
Chromium	3.29	50	100	<50 (<50)	<50 (<50)							<50 (<50)		<50 (<50)
Cobalt	N/A	100		<100 (<100)	<100 (<100)							<100 (<100)		<100 (<100)
Copper	2.3	50	1,300	<50 (<50)	<50 (<50)							<50 (<50)		<50 (<50)
Iron	25	100		180-2,800 (<100-1,600)	5,600 (880)							<100 (<100)		<100 (<100)

☐ CT&E Data.
N/A Not available.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Garage (SS06)

Matrix: Surface Water
Units: µg/L

METALS ANALYSES: TOTAL
(DISSOLVED)

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Sample						Field Blank			Lab Blanks
					SW02							EB02		
Laboratory Sample ID Numbers					4356-12 4354-10 4358-5							4356-2		4354 4356 4358
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L							µg/L		µg/L
Lead	6.6	100	15	<100 (<100)	<100 (<100)							<100 (<100)		<100 (<100)
Magnesium	47.8	200		<5,000-53,000 (2,600-54,000)	26,000 (26,000)							<200 (<200)		<200 (<200)
Manganese	1.24	50		<50-510 (<50-120)	1,700 (1,700)							<50 (<50)		<50 (<50)
Molybdenum	N/A	50		<50 (<50)	<50 (<50)							<50 (<50)		<50 (<50)
Nickel	5.5	50	100	<50 (<50)	<50 (<50)							<50 (<50)		<50 (<50)
Potassium	1,154	5,000		<5,000 (<5,000)	<5,000 (<5,000)							<5,000 (<5,000)		<5,000 (<5,000)
Selenium	62.4	100	50	<100 (<100)	<100 (<100)							<100 (<100)		<100 (<100)
Silver	2.6	50	50	<50 (<50)	<50J (<50)J							<50 (<50)		<50 (<50)
Sodium	27.7	250		8,400-410,000 (8,200-450,000)	45,000 (44,000)							370 (400)		<250 (<250)
Thallium	0.57	5	2	<5 (<5)	<5 (<5)							<5 (<5)		<5 (<5)

☐ CT&E Data.
N/A Not available.
J Result is an estimate.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Garage (SS06)

Matrix: Surface Water
Units: µg/L

METALS ANALYSES: TOTAL
(DISSOLVED)

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Sample						Field Blank			Lab Blanks
					SW02							EB02		
Laboratory Sample ID Numbers					4356-12 4354-10 4358-5							4356-2		4354 4356 4358
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L							µg/L		µg/L
Vanadium	1.8	50		<50 (<50)	<50 (<50)							<50 (<50)		<50 (<50)
Zinc	8.2	50		<50-160 (<50)	<61 (<50)							<50 (<50)		<50 (<50)

☐ CT&E Data.

TABLE 3-4. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE GARAGE (SS06)

SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM CONCENTRATION	UNITS	BACKGROUND RANGE	RBSL[a]		ARAR[b]	CHEMICAL OF CONCERN
						CANCER	NON-CANCER		
Garage	Soil/Sediment	DRPH	33,400J	mg/kg	<50-<100	--	--	500[c]	**Yes**
(SS06)		GRPH	937	mg/kg	<3J-<4J	--	--	100[c]	**Yes**
		RRPH	40,000	mg/kg	<100	--	--	2,000[c]	**Yes**
		Benzene	0.3J	mg/kg	<0.02-<0.04	2.2	--	0.5[c]	No
		Toluene	4	mg/kg	<0.02-<0.04	--	5,400	--	No
		Ethylbenzene	14	mg/kg	<0.03-<0.04	--	2,700	--	No
		Xylenes (Total)	42J	mg/kg	<0.04-<0.08	--	54,000	--	No
		cis-1,2-Dichloroethene							
		Isopropylbenzene	0.022J	mg/kg	<0.030-<0.150	--	--	--	**Yes***
		p-Isopropyltoluene	0.042J	mg/kg	<0.030-<0.150	--	--	--	**Yes***
		Methylene Chloride	0.023BJ	mg/kg	<0.030-<0.150	8.53	1,620	90[d]	No
		Naphthalene	0.158J	mg/kg	<0.030-<0.150	--	1,100	--	No
		n-Propylbenzene	0.068J	mg/kg	<0.030-<0.150	--	--	--	**Yes***
		Tetrachloroethene	43J	mg/kg	<0.03-<0.04	1.23	270	--	**Yes**
		Trichloroethane,1,1,2-	1.8J	mg/kg	<0.03-<0.04	1.1	110	5[d]	**Yes**
		Trichloroethene	2J	mg/kg	<0.03-<0.04	5.8	--	--	No
		1,2,4-Trimethylbenzene	0.315J	mg/kg	<0.030-<0.150	--	--	--	**Yes***
		1,3,5-Trimethylbenzene	0.497J	mg/kg	<0.030-<0.150	--	--	--	**Yes***
		Aluminum	2,300	mg/kg	1,500-25,000	--	--	--	No
		Barium	290	mg/kg	27-390	--	1,890	--	No
		Calcium	2,000	mg/kg	360-59,000	--	--	--	No
		Chromium	54	mg/kg	<4.3-47	--	135	--	No
		Iron	20,000	mg/kg	5,400-35,000	--	--	--	No
		Lead	195	mg/kg	<5.1-22	--	--	500[e]	No
		Magnesium	1,300	mg/kg	360-7,400	--	--	--	No

TABLE 3-4. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE GARAGE (SS06) (CONTINUED)

SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM CONCENTRATION	UNITS	BACKGROUND RANGE	RBSL[a]		ARAR[b]	CHEMICAL OF CONCERN
						CANCER	NON-CANCER		
Garage	Soil/Sediment	Manganese	270	mg/kg	25-290	--	3,780	--	No
(SS06)	(Continued)	Nickel	16	mg/kg	4.2-46	--	540	--	No
(Continued)		Potassium	430	mg/kg	<300-2,200	--	--	--	No
		Sodium	250	mg/kg	<160-680	--	--	--	No
		Vanadium	13	mg/kg	6.3-59	--	189	--	No
		Zinc	85	mg/kg	9.2-95	--	8,100	--	No
	Surface Water[g]	Naphthalene	2.1	µg/L	<1	--	150	--	No
		1,3,5-Trimethylbenzene	1.2	µg/L	<1	--	--	--	**Yes***
		Barium	360	µg/L	<50-93	--	256	2,000[f]	**Yes**
		Calcium	52,000	µg/L	4,100-88,000	--	--	--	No
		Iron	5,600	µg/L	<100-28,000	--	--	--	No
		Magnesium	26,000	µg/L	<5,000-54,000	--	--	--	No
		Manganese	1,700	µg/L	<50-510	--	18.3	--	**Yes**
		Sodium	45,000	µg/L	8,200-450,000	--	--	--	No

* The COCs selected for the site do not include metals that are considered essential human nutrients or analytes that do not have an RBSL or ARAR; however, these chemicals were discussed in the Point Lay Risk Assessment (U.S. Air Force 1996).
a Risk-Based Screening Level.
b Applicable or Relevant and Appropriate Requirement.
c ADEC 1991.
d 57 FR 31776 (17 July 1992).
e EPA 1991c.
f MCL, 56 FR 30266 (01 January 1991).
g The concentrations reported for metals in surface water are total metals.
B The analyte was detected in the associated blank.
J Result is an estimate.

3.3 DRAINAGE PATHWAY FROM POL TANKS (SS07)

3.3.1 Site Background

The Drainage Pathway from POL Tanks (SS07) is located along the bluff between the fuel storage area and the Kasegaluk Lagoon. The site consists of three small streams and a beach bluff located at the edge of the gravel pad. The gravel pad area was historically a drum storage area. An ADEC representative who inspected this site during the reconnaissance visit felt this area appeared potentially contaminated. Styrofoam and fabric debris are partially buried in some areas along the bluff at this site.

The site-specific environmental setting describing the topography, surface water drainage, and soil types is presented in the discussion of potential migration pathways, Section 3.3.3.

3.3.2 Field Sampling and Analytical Results

This section describes the RI sampling and analytical results for samples collected at the Drainage Pathway from POL Tanks (SS07) site. The discussion presents a review of laboratory data, data summary tables, contaminants identified, contaminant trends, and information on suspected source areas.

3.3.2.1 Summary of Samples Collected. A total of 13 samples was collected at the site. These consisted of seven sediment and five surface water samples. Table 2-2 presents a detailed summary of the samples collected and the analyses performed during the 1993 RI field activities. Locations of all samples collected at the Drainage Pathway from POL Tanks (SS07) site are presented in Figure 3-3.

Seven sediment samples were analyzed for DRPH and GRPH. In addition, four samples were analyzed for RRPH, BTEX, and VOCs. One sample was analyzed for pesticides.

Six surface water samples were analyzed for DRPH and GRPH. In addition, four samples were analyzed for VOCs, three samples were analyzed for RRPH, HVOCs, and BTEX. One sample was analyzed for SVOCs, TDS, TSS, and TOC.

3.3.2.2 Analytical Results. The data summary table (Table 3-6) presents analytical results for all samples collected at the site. Detection and quantitation limits, action levels, associated laboratory and field blanks, and background analytical results are presented for each of the analyses. Background levels are listed to allow direct comparison of naturally occurring organic compounds with samples collected from the site. Sample locations and analytical results for the samples at the site are illustrated in Figure 3-3. All organic compounds detected are presented on the figure except when they were a result of laboratory contamination or field decontamination procedures. The exceptions are presented on the data summary table.

The following section presents a discussion of organic compounds detected above background levels at the site. A discussion of TDS, TSS, and TOC is included.

Organics. Organic compounds detected in soil and sediment samples collected at the site include DRPH, GRPH, BTEX compounds, and one other VOC. DRPH were detected in three samples ranging from 10.8 to 27.7 mg/kg; it was reported by the laboratory that the chromatograph patterns for environmental petroleum hydrocarbons in these samples were not consistent with those for a middle distillate fuel. GRPH were detected in one sediment sample, SS07-SD04, at 3 mg/kg. BTEX compounds were detected at very low concentrations in two samples. Total BTEX was detected at 0.71 and 0.032 mg/kg; xylenes were the primary component. One other VOC, naphthalene, was detected at very low concentrations in sediment sample SS07-2SD05; naphthalene is a common component of diesel fuel.

In the surface water sample, organic compounds detected include DRPH, GRPH, benzene, ethylbenzene, xylenes, and six other VOCs. DRPH were detected in two surface water samples at 961 and 260 µg/L (SS07-2SW04 and SS07-2SW06, respectively); however, the laboratory reported that the chromatograph patterns for environmental petroleum hydrocarbons in these samples were not consistent with those for a middle distillate fuel. GRPH were detected at 189 µg/L in surface water sample SS07-2SW06. Benzene was detected at 1.7 µg/L in surface water sample SS07-2SW04. Ethylbenzene and xylenes were detected at low levels (5 and 12 µg/L, respectively) in surface water sample SS07-SW01. Six other VOCs were detected in the four surface water samples. The six VOCs detected were tetrachloroethene (2 µg/L), trichloroethene (3.9 to 133 µg/L), dichloroethene (2.3 µg/L), cis-1,2,-dichloroethene (7.5 to 178 µg/L), trans-1,2-dichloroethene (2.1 to 3.6 µg/L), and trichlorobenzene (1.3 µg/L).

Inorganics. Metals were not a concern at the site, and no metals analyses were performed. TOC, TSS, and TDS were reported in surface water sample SS07-SW02 at 15,500, 28,000, and 1,976,000 µg/L, respectively.

3.3.2.3 Summary of Site Contamination. DRPH detected at the site are probably of biogenic origin; the DRPH detected in both the soil/sediment and surface water samples were reported to have chromatograph patterns that were not consistent with patterns for a middle distillate fuel. GRPH detected are probably related to solvent contamination. The source of these solvents in water is suspected to be related to the repainting of the POL tanks approximately two weeks prior to sample collection, but may also be attributable to a drum storage area that was formerly located on the gravel pad. Because these compounds were detected in flowing surface water, no estimate of the volume of contamination was made.

3.3.3 Migration Pathways

This section describes the topography and stratigraphy of the site and the migration potential of contaminants from the site. A discussion of receptors and chemical concentrations at receptors is included.

3.3.3.1 Topography and Stratigraphy. The beach bluff at the site is approximately 10 feet high and separates the relatively flat tundra area at the installation from the lagoon; between the foot of the beach bluff and the lagoon is a sandy beach. The bluff is incised by three small streams fed by springs at the top of the bluff. These streams infiltrate into the sandy beach at the foot of the bluff.

During the 1993 RI, permafrost was located at a depth of approximately two feet thick in tundra areas and four feet under gravel pads. Gravel pads consisted of the typical gravels and sands associated with these features, and subsurface tundra materials were of the typical stratigraphy associated with the Point Lay area (Section 2.4.4.2). Along the beach subsurface materials consisted of the typical sands, gravels, and fine materials associated with these features.

3.3.3.2 Migration Potential.

Subsurface Migration. The small streams at the site are fed by active layer water springs; the water in these features has a subsurface origin near the top of the bluff. The presence of organic contaminants in surface water samples from these streams indicates that the subsurface water feeding the streams is potentially contaminated. The source of these analytes has not been identified, but it is probably in the gravel area above the bluff and/or upgradient of the gravel area in the POL tank area. Based upon these considerations, the subsurface migration potential for this site is considered to be high.

Surface Migration. Analytical results indicate the streams at the site have been contaminated with low levels of organic compounds. Because these streams drain to the vicinity of the lagoon, the surface migration potential at the site is considered to be high.

Air Transport. Air transportation is not considered to be a significant mode of migration at the site (Section 2.4.4.5).

Summary of Migration Potential. The occurrence of organic contaminants in active layer spring-fed streams indicates that subsurface migration has probably occurred in the gravel pad area above the beach bluff. The streams in which the analytes were detected drain to the immediate vicinity of Kasegaluk Lagoon, providing a pathway for contaminated surface water to enter the lagoon. The migration potential for both surface and subsurface water at the site is considered to be high.

3.3.3.3 Receptors and Chemical Concentrations at Receptors.

Human Receptors. Potential human receptors at the Drainage Pathway from POL Tanks site include Air Force contractor personnel working at the station, visitors to the station, and an occasional local visitor passing the site to get to recreational or subsistence lands. Human receptors could potentially be exposed to the chemicals detected in surface water and soil/sediments at the site. The primary routes of potential exposures at the site are direct contact with soil/sediment, incidental ingestion of soil/sediment, and ingestion of surface water. Because ground water and air at the Point Lay sites are not considered complete pathways of exposure, these media are not evaluated as potential pathways to human receptors.

The Point Lay Risk Assessment (U.S. Air Force 1996) evaluates in detail the risks to human health from all COCs detected at the site. The potential receptor groups were selected based on their likelihood of exposure to contaminants at the site and include DEW Line workers at the installation, and native adults and children who may visit the site. The estimated exposure point concentrations for human receptors are based on the maximum concentration of each chemical

detected at the site. The potential risks to human health associated with chemicals at the site are presented in Section 3.3.4.

Ecological Receptors. Ecological receptors were evaluated in detail in the Point Lay Risk Assessment (U.S. Air Force 1996) to determine if plants and animals could potentially be impacted by the chemicals detected at the Point Lay installation. Because of the diversity of the plants and animals in the area of the Point Lay installation, a set of representative species was selected in the ERA for detailed evaluation. The species include plants, aquatic invertebrates, fish, birds, and mammals. These receptors were selected based on the species' likelihood of exposure given their preferred habitat and feeding habits. The representative species encompass a range of ecological niches in order to achieve the best characterization of the ecosystems being examined and are presented in Table 2-6.

The estimate of chemical concentrations at the ecological receptors was based on the average site-wide concentration of each COC. This approach was appropriate because few of the representative species would inhabit only one distinct site at the installation; they are more likely to be exposed to the mix of chemicals and concentrations detected on all the sites at Point Lay. The potential ecological risks associated with the chemicals detected at the site are presented in Section 3.3.5.

3.3.4 Human Health Risk Assessment

This section presents a summary of the potential human health risks associated with the chemicals detected at the Drainage Pathways from POL Tanks (SS07) site. The purpose of the human health risk assessment is to quantify the excess lifetime cancer risk and/or the noncancer hazard (reported as hazard index) from the contaminants detected at the site.

This summary presents the COCs at the site, the pathways by which human receptors may be exposed to site chemicals, potential risks to human health posed by each chemical through each exposure pathway, the significance of the risk and/or hazard estimate, and a comparison of site chemical concentrations to ARARs. The methods and assumptions used in calculating hazards and risks are presented in Section 2.4.1.

3.3.4.1 Chemicals of Concern. At the Drainage Pathway from POL Tanks (SS07), no COCs were identified for the soil matrix at the Drainage Pathway from POL Tanks site based on a comparison of the maximum concentrations of detected chemicals to their background, RBSL, or ARAR concentrations.

DRPH, GRPH, benzene, tetrachloroethene, trichloroethene, 1,1-dichloroethene, and cis-1,2-dichloroethene were identified as COCs for the surface water at the Drainage Pathway from POL Tanks site. DRPH and cis-1,2-dichloroethene exceeded their RBSLs based on noncancer hazard; cis-1,2-dichloroethene also exceeded an ARAR which is an MCL promulgated under the federal Safe Drinking Water Act. Benzene, tetrachloroethene, and 1,1-dichloroethene exceeded their RBSLs based on cancer risk, and trichloroethene exceeded an ARAR which is an MCL promulgated under the federal Safe Drinking Water Act.

Table 3-6, Identification of COCs at the Drainage Pathway from POL Tanks, presents the maximum concentrations of chemicals detected at the site, the associated background concentrations, RBSLs, and ARARs, and identifies COCs selected in the risk evaluation.

3.3.4.2 Exposure Pathways and Potential Receptors. Because no COCs were identified for soil/sediment at the site, only surface water ingestion pathways were evaluated in the risk assessment.

Three potential receptor groups were evaluated in the risk assessment: an adult assigned to a DEW Line installation (worker), an adult inhabitant of communities in the North Slope of Alaska (native), and a child living in a North Slope community (child).

3.3.4.3 Risk Characterization.

Noncancer Hazard and Cancer Risk Associated with Soils and Sediments. No COCs were selected for the soil at the Drainage Pathway from POL Tanks site. This does not indicate that exposure to chemicals in the soil at this site is without health risk; however, the concentrations measured were less than the concentrations considered acceptable under Region 10 guidance (EPA 1991a) or federal ARARs.

Noncancer Hazard and Cancer Risk Associated with Surface Water. The noncancer hazard associated with the ingestion of surface water at the Drainage Pathway from POL Tanks site by a hypothetical native northern adult or by a DEW Line worker is 0.4, based on the maximum concentrations of the COCs. DRPH, GRPH, tetrachloroethene, 1,1-dichloroethene, and cis-1,2-dichloroethene account for the quantifiable noncancer hazard for these receptor/pathway combinations. DRPH and cis-1,2-dichloroethene together account for more than 90 percent of the noncancer hazard.

The excess lifetime cancer risk associated with the ingestion of surface water at this site by native northern adults is 4×10^{-5}, and by DEW Line workers is 7×10^{-6}, based on the maximum concentrations of the COC. The presence of GRPH, benzene, tetrachloroethene, trichloroethene, and 1,1-dichloroethene accounts for the quantifiable excess lifetime cancer risk for these receptor/pathway combinations.

Summary of Human Health Risk Assessment. The potential risks and hazards associated with the surface water at the Drainage Pathway from POL Tanks are the very low noncancer hazard (hazard index of 0.4), and very low cancer risk associated with the GRPH, benzene, tetrachloroethene, trichloroethene, and 1,1-dichloroethene. Remedial action is generally not warranted at sites where the excess lifetime cancer risk is less than 1×10^{-4} or the noncancer hazards do not significantly exceed one (EPA 1991b), and on the basis of the risk assessment remediation of the site is not warranted.

The potential risks and hazards were calculated assuming the affected surface water would be used as a sole-source water supply for 180 days per year. Based on site-specific information, the chemicals in surface water do not currently pose a health hazard nor are they likely to pose a hazard in the future. The surface water expressions at the site are frozen most of the year;

many are only intermittently filled with water during the summer months. The surface water at the site is not known to be used as a water supply now, nor has it been used in the past. In conclusion, under current uses the COCs identified in surface water at the Drainage Pathway from POL Tanks site pose only a minimal, if any, potential threat to human health. In the unlikely event that surface water at the site is used as a sole-source drinking water supply in the future, a potential noncancer hazard to human health could exist if conditions remain constant.

In conclusion, the COCs identified in surface water at the Drainage Pathway from POL Tanks site pose only a minimal, if any, potential threat to human health. Based on the human health risk assessment, remedial actions are not warranted at the site.

3.3.5 Ecological Risk Assessment

The objective of the ERA is to estimate the potential impacts of chemicals detected at the installation on aquatic and terrestrial plants and animals. A summary of the methods used to assess potential ecological impacts is presented in Section 2.4.2.

3.3.5.1 Chemicals of Concern. COCs were selected based on criteria presented in Section 3.1 of the ERA. The average installation-wide concentration of COCs were used to calculate risk estimates. All sites at the installation were considered to be potentially usable habitat. The COC selection process only considered the soil/sediment samples that were at or less than 1.5 feet deep. The soil/sediment samples were screened for depth because it is unlikely that any of the representative species will be exposed to soil/sediments deeper than 1.5 feet. Iron, manganese, and DRPH were identified as COCs in surface water, and the COCs in soils/sediments at the site were DRPH, GRPH, and BTEX. None of the identified COCs was associated with significant risk estimates at the Drainage Pathway from POL Tanks site.

3.3.5.2 Summary of Ecological Risk Assessment. Based on the quantification of potential risks to ecological receptors and discussions presented in the Point Lay ERA, ecological risks at the Drainage Pathway from POL Tanks site are minimal.

3.3.6 Conclusions and Recommendations

Sampling and analyses have determined that the Drainage Pathway from POL Tanks (SS07) site is contaminated with solvents and petroleum hydrocarbons (GRPH). The affected area at the site is the surface water along the bluff and at the base of the bluff. The suspected source of contamination is suspected to be related to the repainting of the POL tanks approximately two weeks prior to sample collection, but may also be attributable to a drum storage area that was formerly located on the gravel pad. Because the contaminants were detected in flowing surface water, no estimate of the volume of contamination was made.

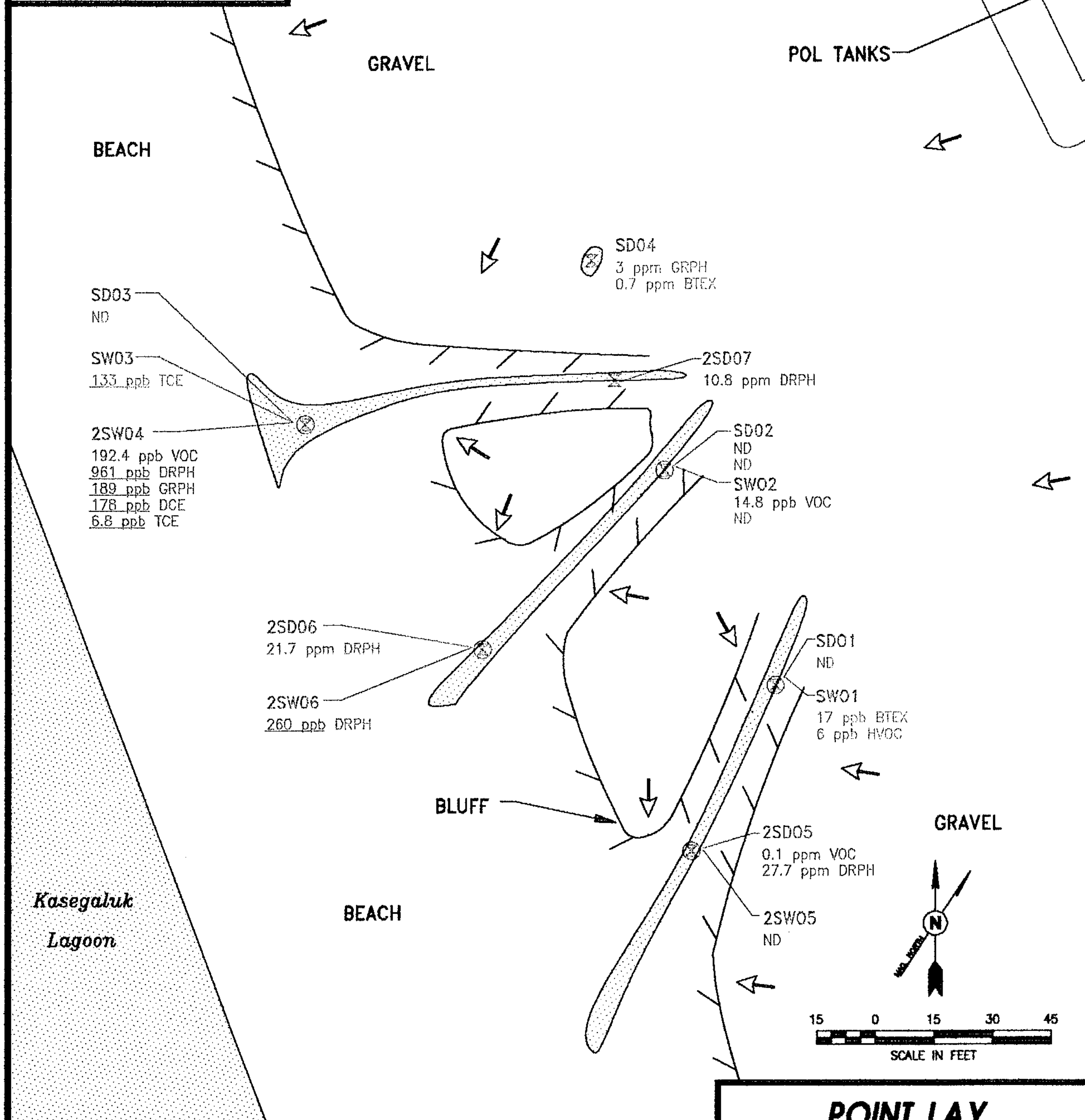
The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current and future site uses. The potential human health risks at the site are not of a magnitude that normally requires remedial action. The ERA concluded that the overall potential risks presented by site contaminants are minimal. Therefore,

considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Levels of solvents detected in surface water at the site exceed ADEC guidance cleanup levels and have migrated downgradient of the site. Therefore, the site is being recommended for remedial action. The affected area at the site is surface water at the beach bluff and the base of the bluff adjacent to Kasegaluk Lagoon. The remedial action alternative recommended for the site is monitoring. If contaminants continue to be detected at the site, then further investigation may be warranted. A complete description and evaluation of the remedial alternatives considered for this site are presented in the FS, Section 4.0.

THIS PAGE INTENTIONALLY LEFT BLANK

DRAWING No. LAYSS07



LEGEND

	BLUFF
	SEDIMENT SAMPLE
	SEDIMENT AND WATER SAMPLES
	SURFACE WATER
	GRAVEL PAD BOUNDARY
	SURFACE DRAINAGE
2.6 ppm	CT&E DATA
0.9 ppm	F&B DATA

0000	CONCENTRATIONS ARE ABOVE ACTION LEVELS
ND	NO CONTAMINATION DETECTED
VOC	TOTAL VOLATILE ORGANIC COMPOUNDS
DRPH	DIESEL RANGE PETROLEUM HYDROCARBONS
GRPH	GASOLINE RANGE PETROLEUM HYDROCARBONS
BTEX	TOTAL BTEX COMPOUNDS
HVOC	TOTAL HALOGENATED VOLATILE ORGANIC COMPOUNDS
DCE	cis-1,2-DICHLOROETHENE
TCE	TRICHLOROETHENE

POINT LAY RADAR INSTALLATION

USAF 611th CES

FIGURE NO. 3-3
DRAINAGE PATHWAY FROM POL TANKS (SS07) SAMPLE LOCATIONS AND ANALYTICAL RESULTS

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE 3-5. DRAINAGE PATHWAY FROM POL TANKS ANALYTICAL DATA SUMMARY

Installation: Point Lay — Matrix: Sediment
Site: Drainage Pathway from POL Tanks (SS07) — Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples				Field Blanks			Lab Blanks	
					SD01	SD02	SD03	SD04	AB01	EB02	TB02		
Laboratory Sample ID Numbers					628	630 4354-9	632	634	4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356	#5-82593 #1&2-82593 4354
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg	µg/L	µg/L	mg/kg
DRPH	6-9	60-90	500[a]	<50[b]-<100[b]	<80[b]	<60[b]	<80[b]	<70[b]	NA	<1,000[b]	NA	<1,000	<50
GRPH	0.3-0.4	3-4	100	<3J[b]-<4J[b]	<4J[b]	<4J[b]	<3J[b]	3J[b]	NA	<100J[b]	<100J[b]	<100J	<1J
RRPH (Approx.)	12	120	2,000[a]	<100	<120	<120	<120	<120	NA	<2,000	NA	<2,000	<100
BTEX (8020/8020 Mod.)			10 Total BTEX	<0.13-<0.20	<0.20	<0.15	<0.15	0.71J					
Benzene	0.003-0.004	0.03-0.04	0.5	<0.02-<0.04	<0.04	<0.03	<0.03	0.07J	<1[c]	<1	<1	<1	<0.02
Toluene	0.003-0.004	0.03-0.04		<0.02-<0.04	<0.04	<0.03	<0.03	0.04	<1[c]	<1	<1	<1	<0.02
Ethylbenzene	0.003-0.004	0.03-0.04		<0.03-<0.04	<0.04	<0.03	<0.03	0.2	<1[c]	<1	<1	<1	<0.02
Xylenes (Total)	0.006-0.008	0.06-0.08		<0.04-<0.08	<0.08	<0.06	<0.06	0.4J	<2[c]	<2	<2	<2	<0.04
VOC 8260	0.020	0.025		<0.030-<0.150	NA	<0.025	NA	NA	<1	<1	<1-12	<1	<0.020
Pesticides	0.2-5	2-50		<0.02J-<0.5J	<2-<50	NA	NA	NA	NA	<0.2J-<50J	NA	NA	<0.2J-<0.5J

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
a The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c Total BTEX determined by 8260 method analysis.

TABLE 3-5. DRAINAGE PATHWAY FROM POL TANKS ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay   Matrix: Sediment
Site: Drainage Pathway from POL Tanks (SS07) Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples				Field Blanks			Lab Blanks	
					2SD05	2SD06	2SD07		AB01	2EB03	2TB03		
Laboratory Sample ID Numbers					4692-6	4692-7	4692-8		4356-5	4692-17	4692-16	4356 4692	4692
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	4.00	4.00	500[a]	<50[b]-<100[b]	27.7J[d]	21.7[e]	10.8[e]		NA	NA	NA	NA	<4.00
GRPH	0.400	0.500-0.600	100	<3J[b]-<4J[b]	<0.600	<0.500	<0.600		NA	NA	NA	NA	<0.400
VOC 8260													
Naphthalene	0.020	0.025-0.030		<0.030-<0.150	0.030J	<0.025	<0.030		<1	NA	NA	<1	<1
Xylenes (Total)	0.040	0.050-0.060		<0.060-<0.300	0.032J[c]	<0.050	<0.060		<2	<2	<2	<2	<2

- ☐ CT&E Data.
- ▩ F&B Data.
- NA Not analyzed.
- J Result is an estimate.
- a The action level for DRPH is based on consversations with ADEC; a final action level has not yet been determined.
- b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
- c Result is indicative of p & m-xylenes only.
- d The laboratory reported that 10.3 mg/kg of the EPH pattern in this sample was not consistent with a middle distillate fuel.
- e The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel.

TABLE 3-5. DRAINAGE PATHWAY FROM POL TANKS ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Matrix: Surface Water
Site: Drainage Pathway from POL Tanks (SS07) Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples					Field Blanks			Lab Blanks
					SW01	SW02	SW03			AB01	EB02	TB02	
Laboratory Sample ID Numbers					558/582	584/586 4356-7	588/589			4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L	µg/L	µg/L	µg/L
DRPH	100	1,000		<1,000[b]	<1,000[b]	<1,000[b]	<1,000[b]			NA	<1,000[b]	NA	<1,000
GRPH	10	100		<50J[b]	<100J[b]	<100J[b]	<100J[b]			NA	<100J[b]	<100J[b]	<100J
RRPH (Approx.)	200	2,000		<2,000	<2,000	<2,000	<2,000			NA	<2,000	NA	<2,000
BTEX (8020/8020 Mod.)													
Benzene	0.1	1	5	<1	<1	<1	<1			<1[c]	<1	<1	<1
Toluene	0.1	1	1,000	<1	<1	<1	<1			<1[c]	<1	<1	<1
Ethylbenzene	0.1	1	700	<1	5J	<1	<1			<1[c]	<1	<1	<1
Xylenes (Total)	0.2	2	10,000	<2	12J	<2	<2			<2[c]	<2	<2	<2
HVOC 8010													
Tetrachloroethene	0.1	1	5	<1	2	<1	<1			NA	<1	<1	<1
Trichloroethene	0.1	1	5	<1	4	<1	133			NA	<1	<1	<1
VOC 8260													
cis-1,2-Dichloroethene	1	1	70	<1	NA	7.5	NA			<1	<1	<1	<1

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 3-5. DRAINAGE PATHWAY FROM POL TANKS ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Matrix: Surface Water
Site: Drainage Pathway from POL Tanks (SS07) Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples					Field Blanks			Lab Blanks
					SW01	SW02	SW03			AB01	EB02	TB02	
Laboratory Sample ID Numbers					558/582	584/586 4356-7	588/589			4356-5	557/572 4356-2	569 4356-1	4356
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L	µg/L	µg/L	µg/L
trans-1,2-Dichloroethene	1	1	100	<1	NA	2.1	NA			<1	<1	<1	<1
1,2,3-Trichlorobenzene	1	1		<1	NA	1.3	NA			<1	<1	<1	<1
Trichloroethene	1	1	5	<1	NA	3.9	NA			<1	<1	<1	<1
SVOC 8270	10	19		<20-<31	NA	<19	NA			NA	<25	NA	<10
TOC	5,000	5,000		31,700-40,000	NA	15,500	NA			NA	NA	NA	NA
TSS	100	200		6,000-77,000	NA	28,000	NA			NA	NA	NA	<200
TDS	10,000	10,000		149,000-151,000	NA	1,976,000	NA			NA	NA	NA	<10,000

☐ CT&E Data.
NA Not analyzed.

TABLE 3-5. DRAINAGE PATHWAY FROM POL TANKS ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Matrix: Surface Water
Site: Drainage Pathway from POL Tanks (SS07) Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples						Field Blanks			Lab Blanks
					2SW04	2SW05	2SW06				AB01	2EB03	2TB03	
Laboratory Sample ID Numbers					4692-1	4692-4	4692-5				4356-5	4692-17	4692-16	4356 4692
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L				µg/L	µg/L	µg/L	µg/L
DRPH	100	100-150		<1,000[b]	961[ad]	<150	260[ad]				NA	NA	NA	<100
GRPH	20	20		<50J[b]	189[a]	<20	<20				NA	NA	NA	<20
VOC 8260														
Benzene	1	1	5	<1	1.7	<1	<1				<1	<1	<1	<1
Chloromethane	1	1		<1	3.2B	2.6B	3.6B				<1	3.1U	3.1U	1.09
1,1-Dichloroethene	1	1	7	<1	2.3	<1	<1				<1	<1	<1	<1
cis-1,2-Dichloroethene	1	1	70	<1	178	<1	<1				<1	4.6	1.5	<1
trans-1,2-Dichloroethene	1	1	100	<1	3.6	<1	<1				<1	<1	<1	<1
Trichloroethene	1	1	5	<1	6.8	<1	<1				<1	1.7	<1	<1

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
B The analyte was detected in the associated blank.
J Result is an estimate.
U Compound is not present above the concentration listed.
a Total petroleum hydrocarbons in these water samples exceed the 15 µg/L stated for fresh water in ADEC's Water Quality Criteria 18AAC70 (ADEC 1989).
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
d The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel.

TABLE 3-6. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE DRAINAGE PATHWAY FROM POL TANKS (SS07)

SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM CONCENTRATION	UNITS	BACKGROUND RANGE	RBSL[a] CANCER	RBSL[a] NON-CANCER	ARAR[b]	CHEMICAL OF CONCERN
Drainage Pathway from POL Tanks (SS07)	Sediment	DRPH	27.7J	mg/kg	<50-<100	--	--	500[c]	No
		GRPH	3J	mg/kg	<3-<4	--	--	100[c]	No
		Benzene	0.07J	mg/kg	<0.02-<0.04	2.2	--	0.5[c]	No
		Toluene	0.04	mg/kg	<0.02-<0.04	--	5,400	--	No
		Ethylbenzene	0.2	mg/kg	<0.03-<0.04	--	2,700	--	No
		Xylenes (Total)	0.4J	mg/kg	<0.04-<0.08	--	54,000	--	No
		Naphthalene	0.030J	mg/kg	<0.04-<0.150	--	1,100	--	No
	Surface Water	DRPH	961	µg/L	<1,000	--	292	--	**Yes**
		GRPH	189	µg/L	<50	50	730	--	**Yes**
		Benzene	1.7	µg/L	<1	0.617	--	5[d]	**Yes**
		Ethylbenzene	5J	µg/L	<1	--	158	700[e]	No
		Xylenes (Total)	12J	µg/L	<2	--	7,300	10,000[e]	No
		1,1-Dichloroethene	2.3	µg/L	<1	0.142	32.9	7[d]	**Yes**
		cis-1,2-Dichloroethene	178	µg/L	<1	--	36.5	70[e]	**Yes**
		trans-1,2-Dichloroethene	3.6	µg/L	<1	--	73	100[e]	No
		Tetrachloroethene	2	µg/L	<1	0.143	36.5	5[e]	**Yes**
		Trichloroethene	133	µg/L	<1	0.25	--	5[e]	**Yes**

a Risk-Based Screening Level.
b Applicable or Relevant and Appropriate Requirement.
c ADEC 1991.
d MCL, 52 FR 25690.
e MCL, 56 FR 3526 (30 January 1991).
B The analyte was detected in the associated blank.
J Result is an estimate.

3.4 CRUSHED DRUM AREA (SS08)

3.4.1 Site Background

The Crushed Drum Area (SS08) site is a gravel pad located approximately 150 feet northeast of the module train. The gravel pad slopes gently to the tundra north and east of the site and is adjacent to a drainage pathway that runs from below the east end of the module train to the south end of the gravel pad area at the site. It was determined that an investigation was warranted at this site because of the previous drum-crushing activities.

The site-specific environmental setting describing the topography, surface water drainage, and soil types is presented in the discussion of potential migration pathways, Section 3.3.4.

3.4.2 Field Sampling and Analytical Results

This section describes the RI sampling and analytical results for samples collected at the Crushed Drum Area site. The discussion presents a review of laboratory data, data summary tables, contaminants identified, contaminant trends, and information on suspected source areas.

3.4.2.1 Summary of Samples Collected. A total of 16 samples was collected at the site. These consisted of 11 soil, 3 sediment, and 2 surface water samples. Table 2-2 presents a detailed summary of the samples collected and the analyses performed during the 1993 RI field activities. Locations of all samples collected at the Crushed Drum Area (SS08) site are presented in Figure 3-4.

The 11 soil samples were analyzed for DRPH and GRPH. In addition, nine samples were analyzed for BTEX. Six samples were analyzed for RRPH, HVOCs, and PCBs, and three samples were analyzed for VOCs. Two samples were analyzed for SVOCs, and one sample was analyzed for pesticides and total metals.

The three sediment samples were analyzed for DRPH, GRPH, RRPH, HVOCs, BTEX, and PCBs. In addition, one sample was analyzed for VOCs, SVOCs, and total metals.

Two surface water samples were analyzed for DRPH, GRPH, RRPH, BTEX, HVOCs, and PCBs. In addition, one sample was analyzed for VOCs, SVOCs, total and dissolved metals, TOC, TSS, and TDS.

3.4.2.2 Analytical Results. The data summary table (Table 3-7) presents analytical results for all samples collected at the site. Detection and quantitation limits, action levels, associated laboratory and field blanks, and background analytical results are presented for each of the analyses. Background levels are listed to allow direct comparison of naturally occurring organic compounds with samples collected from the site. Sample locations and analytical results for the samples at the site are illustrated in Figure 3-4. All organic compounds detected are presented on the figure except when they were a result of laboratory contamination or field decontamination procedures. Only metals detected above background levels that exceed an

RBSL or ARAR are presented on Figure 3-1. The exceptions are presented on the data summary table.

The following section presents a discussion of organic compounds and inorganic analytes detected above background levels at the site. A discussion of TDS, TSS, and TOC is included.

Organics. Organic compounds detected in soil and sediment samples collected at the site include DRPH, GRPH, RRPH, BTEX compounds, eight other VOCs, and seven SVOCs. DRPH were detected in eight samples ranging from 4.19 to 17,500 mg/kg. GRPH were detected in seven samples ranging from 1.97 to 2,430 mg/kg. BTEX compounds were also detected in five samples. Total BTEX ranged from 0.80 to 122.2 mg/kg; xylenes were the primary component. Eight other VOCs were detected in soil samples at concentrations ranging from 0.023 to 48 mg/kg. The VOCs include common components of diesel fuel and solvents. Seven SVOCs were detected in three soil/sediment samples at low levels ranging from 0.261 to 11.7 mg/kg; 2-methylnaphthalene was the primary component.

In the surface water sample, organic compounds detected include BTEX compounds and five other VOCs. BTEX were detected at concentrations ranging from 12 to 82 μg/L in surface water sample SS08-SW01; xylenes were the primary component. Five other VOCs that are common components of diesel fuel were detected, ranging from 1.2 to 15 μg/L (isopropyltoluene, naphthalene, n-propylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene).

Inorganics. In soil/sediment samples, no metals that exceeded background concentrations were detected at the site.

In surface water samples, four metals (barium, iron, manganese, and potassium) were detected above background concentrations. TOC, TSS, and TDS were detected in surface water sample SS08-SW01 at 19,600, 23,500, and 596,000 μg/L, respectively.

3.4.2.3 Summary of Site Contamination. The source of contaminants detected during sampling conducted at the Crushed Drum Area (SS08) is suspected to be spills and/or leaks from the diesel day tanks inside the module train. Contaminants were not detected in the area where previous drum crushing activities were conducted. However, contaminants were detected below the module train and the concentration of contaminants decreases with distance from the west end of the module train. No previous IRP sampling is known to have been conducted at the site. The human health and ecological risks associated with the chemicals detected at the site are presented in Sections 3.4.4 and 3.4.5. Based on field data, source of contamination, and concentrations of contaminants, the area of affected media includes approximately 1,730 square feet of tundra and approximately 4,400 square feet of soil underneath the building.

3.4.3 Migration Pathways

This section describes the topography and stratigraphy of the site and the migration potential of contaminants from the site. A discussion of receptors and chemical concentrations at receptors is included.

3.4.3.1 Topography and Stratigraphy. The topography in this area is relatively flat, and most of the relief is from gravel pads and roads. The Crushed Drum Area itself consists of a large gravel pad that slopes gently north and east to the tundra. There is a small circular depression on the west side of the site adjacent to the road. The south end of the gravel pad is adjacent to the drainage pathway that runs from below the west end of the module train. The module train is located southwest of the Crushed Drum Area, and the area below the module train drains through a culvert into a ditch that extends down a slight incline along the southern side of the Crushed Drum Area. This ditch discharges into a pond located along the eastern side of the Crushed Drum Area. The pond drains to the east from both the north and south ends into a marshy area, where it ponds and infiltrates into the subsurface.

During the 1993 RI, permafrost was located at a depth of approximately four feet under gravel pads and two feet under tundra areas. Gravel pads consisted of the typical gravels and sands associated with these features, and subsurface tundra materials were of the typical stratigraphy found at Point Lay (Section 2.4.4.2).

3.4.3.2 Migration Potential.

Subsurface Migration. Analytical data indicate that soil, sediment, and surface water at this site have been contaminated with DRPH, GRPH, BTEX, VOCs, and SVOCs. The presence of contaminated sediments suggests that contaminated surface water has previously affected drainage features. Surface features at the site may infiltrate into the subsurface, and any analytes that may have been present in surface water may have entered the active layer. Therefore, there is a potential that subsurface migration has occurred at the site.

Surface Migration. Analytical data indicate that contaminants have migrated from below the module train and have affected soil, sediment, and surface water in the drainage pathway from below the west end of the module train. Because this pathway flows into relatively flat tundra, migration from this feature is probably limited. Contaminants were not detected in downgradient samples collected northeast of the tundra pond. Offsite migration in surface water, if it occurs, is probably restricted to the spring thaw, when an abundant supply of meltwater and reduced infiltration may increase the water flow from the site. Based upon these considerations, the potential for contaminant migration in surface water is considered to be limited.

Air Transport. Air transportation is not considered to be a significant mode of migration at the site (Section 2.4.4.5).

Summary of Migration Potential. Analytical data suggest that contaminants are migrating from below the west end of the module train, affecting drainage features at the site. The relatively flat topography and drainage features indicate that surface water does not generally flow from the site. Therefore, migration from the site in surface and active layer water is probably limited.

3.4.3.3 Receptors and Chemical Concentrations at Receptors.

Human Receptors. Potential human receptors at the Crushed Drum Area site include Air Force contractor personnel working at the station, visitors to the station, and an occasional local visitor

passing the site to get to recreational or subsistence lands. Human receptors could potentially be exposed to the chemicals detected in surface water and soil/sediments at the site. The primary routes of potential exposures at the site are direct contact with soil/sediment, incidental ingestion of soil/sediment, and ingestion of surface water. Because ground water and air at the Point Lay sites are not considered complete pathways of exposure, these media are not evaluated as potential pathways to human receptors.

The Point Lay Risk Assessment (U.S. Air Force 1996) evaluates in detail the risks to human health from all COCs detected at the site. The potential receptor groups were selected based on their likelihood of exposure to contaminants at the site and include DEW Line workers at the installation, and native adults and children who may visit the site. The estimated exposure point concentrations for human receptors are based on the maximum concentration of each chemical detected at the site. The potential risks to human health associated with chemicals at the site are presented in Section 3.3.4.

Ecological Receptors. Ecological receptors were evaluated in detail in the Point Lay Risk Assessment (U.S. Air Force 1996) to determine if plants and animals could potentially be impacted by the chemicals detected at the Point Lay installation. Because of the diversity of the plants and animals in the area of the Point Lay installation, a set of representative species was selected in the ERA for detailed evaluation. The species include plants, aquatic invertebrates, fish, birds, and mammals. These receptors were selected based on the species' likelihood of exposure given their preferred habitat and feeding habits. The representative species encompass a range of ecological niches in order to achieve the best characterization of the ecosystems being examined and are presented in Table 2-6.

The estimate of chemical concentrations at the ecological receptors was based on the average site-wide concentration of each COC. This approach was appropriate because few of the representative species would inhabit only one distinct site at the installation; they are more likely to be exposed to the mix of chemicals and concentrations detected on all the sites at Point Lay. The potential ecological risks associated with the chemicals detected at the site are presented in Section 3.3.5.

3.4.4 Human Health Risk Assessment

This section presents a summary of the potential human health risks associated with the chemicals detected at the Crushed Drum Area (SS08) site. The purpose of the human health risk assessment is to quantify the excess lifetime cancer risk and/or the noncancer hazard (reported as hazard index) from the contaminants detected at the site.

This summary presents the COCs at the site, the pathways by which human receptors may be exposed to site chemicals, potential risks to human health posed by each chemical through each exposure pathway, the significance of the risk and/or hazard estimate, and a comparison of site chemical concentrations to ARARs. The methods and assumptions used in calculating hazards and risks are presented in Section 2.4.1.

3.4.4.1 Chemicals of Concern. At the Crushed Drum Area (SS08), COCs identified for the soil/sediment matrix were DRPH, GRPH, and benzene. The maximum concentrations of DRPH and GRPH exceeded the background concentrations and the ARAR concentrations for petroleum hydrocarbons contamination of soil (ADEC 1991). Benzene exceeded the background concentration, the RBSL based on cancer risk, and the ARAR concentration for benzene in soil (ADEC 1991).

Benzene, barium, and manganese were identified as COCs for the surface water at the site. Benzene exceeded the background concentration, the RBSL based on cancer risk, and the ARAR, an MCL promulgated under the federal Safe Drinking Water Act. Barium exceeded the RBSL based on noncancer risk but did not exceed the ARAR, an MCL promulgated under the federal Safe Drinking Water Act. Manganese exceeded the background concentration and the RBSL based on noncancer hazard.

Table 3-8, Identification of COCs at the Crushed Drum Area, presents the maximum concentrations of chemicals detected at the site, the associated background concentrations, RBSLs, and ARARs, and identifies COCs selected in the risk evaluation.

3.4.4.2 Exposure Pathways and Potential Receptors. Because COCs were identified for soil/sediment and surface water at the site, the potential risks associated with ingestion of soil/sediment and surface water were evaluated in the risk assessment.

Three potential receptor groups were evaluated in the risk assessment: an adult assigned to a DEW Line installation (worker), an adult inhabitant of communities in the North Slope of Alaska (native), and a child living in a North Slope community (child).

3.4.4.3 Risk Characterization.

Noncancer Hazard and Cancer Risk Associated with Soils and Sediments. The noncancer hazard associated with the ingestion of soil at the Crushed Drum Area by a hypothetical native northern adult/child is 0.3 and by a DEW Line worker is 0.01, based on the maximum concentrations of the COCs. The presence of DRPH and GRPH accounts entirely for the quantifiable noncancer hazard for these receptor/pathway combinations. The excess lifetime cancer risk associated with the ingestion of soil at the site by the hypothetical native northern adult/child is 7×10^{-7}, and by a DEW Line worker is 3×10^{-8}, based on the maximum concentrations of the COCs. The presence of GRPH and benzene accounts entirely for the quantifiable excess lifetime cancer risk for these receptor/pathway combinations.

Noncancer Hazard and Cancer Risk Associated with Surface Water. The noncancer hazard associated with the ingestion of surface water at the Crushed Drum Area by a hypothetical native northern adult or by a DEW Line worker is 1.8, based on the maximum concentration of the COCs. Manganese and barium account entirely for the quantifiable noncancer hazard for these receptor/pathway combinations. Manganese alone accounts for 99 percent of the noncancer hazard.

The excess lifetime cancer risk associated with the ingestion of surface water at this site by native northern adults is 5×10^{-6}, and by a DEW Line worker is 9×10^{-7}, based on the maximum concentration of the COC. The presence of benzene accounts entirely for the quantifiable excess lifetime cancer risk for these receptor/pathway combinations.

Summary of Human Health Risk Assessment. The potential risks and hazards associated with the soil/sediment at the Crushed Drum Area are the very low noncancer hazard (hazard indices of 0.3 and 0.01), and very low cancer risk associated with the GRPH and benzene. The noncancer hazards are below one and were calculated conservatively based on a residential scenario. Therefore, the noncancer hazards associated with soil/sediment at the site are minimal. The cancer risks are well below threshold value of 1×10^{-6} (EPA 1991b) and are also considered minimal.

The potential risks and hazards associated with the surface water at the site are the low hazard index (1.8) associated with manganese and barium and the very low cancer risks associated with benzene. The potential risks and hazards were calculated assuming the affected surface water would be used as a sole-source water supply for 180 days per year. Based on site-specific information, the chemicals in surface water do not currently pose a health hazard nor are they likely to pose a hazard in the future. The surface water expressions at the site are frozen most of the year; many are only intermittently filled with water during the summer months. The surface water at the site is not known to be used as a water supply now, nor has it been used in the past. In conclusion, under current uses the COCs identified in surface water at the Crushed Drum Area site pose only a minimal, if any, potential threat to human health. In the unlikely event that surface water at the site is used as a sole-source drinking water supply in the future, a potential noncancer hazard to human health could exist if conditions remain constant.

In conclusion, under current uses, the COCs identified in soil/sediment and surface water at the Crushed Drum Area site pose only a minimal, if any, potential threat to human health. Based on the human health risk assessment, remedial actions are not warranted at the site.

3.4.5 Ecological Risk Assessment

The objective of the ERA is to estimate the potential impacts of chemicals detected at the installation on aquatic and terrestrial plants and animals. A summary of the methods used to assess potential ecological impacts is presented in Section 2.4.2.

3.4.5.1 Chemicals of Concern. COCs were selected based on criteria presented in Section 3.1 of the ERA. The average installation-wide concentration of COCs were used to calculate risk estimates. All sites at the installation were considered as potentially usable habitat. The COC selection process only considered the soil/sediment samples that were at or less than 1.5 feet deep. The soil/sediment samples were screened for depth because it is unlikely that any of the representative species will be exposed to soil/sediments deeper than 1.5 feet. Iron and manganese were identified as COCs in surface water, and the COCs in soils/sediments at the Crushed Drum Area were DRPH, GRPH, RRPH, BTEX, benzyl alcohol, selenium, and zinc. None of the identified COCs was associated with significant risk estimates at the Crushed Drum Area.

3.4.5.2 Summary of Ecological Risk Assessment. Based on the quantification of potential risks to ecological receptors and discussions presented in the Point Lay ERA, ecological risks at the Crushed Drum Area are minimal.

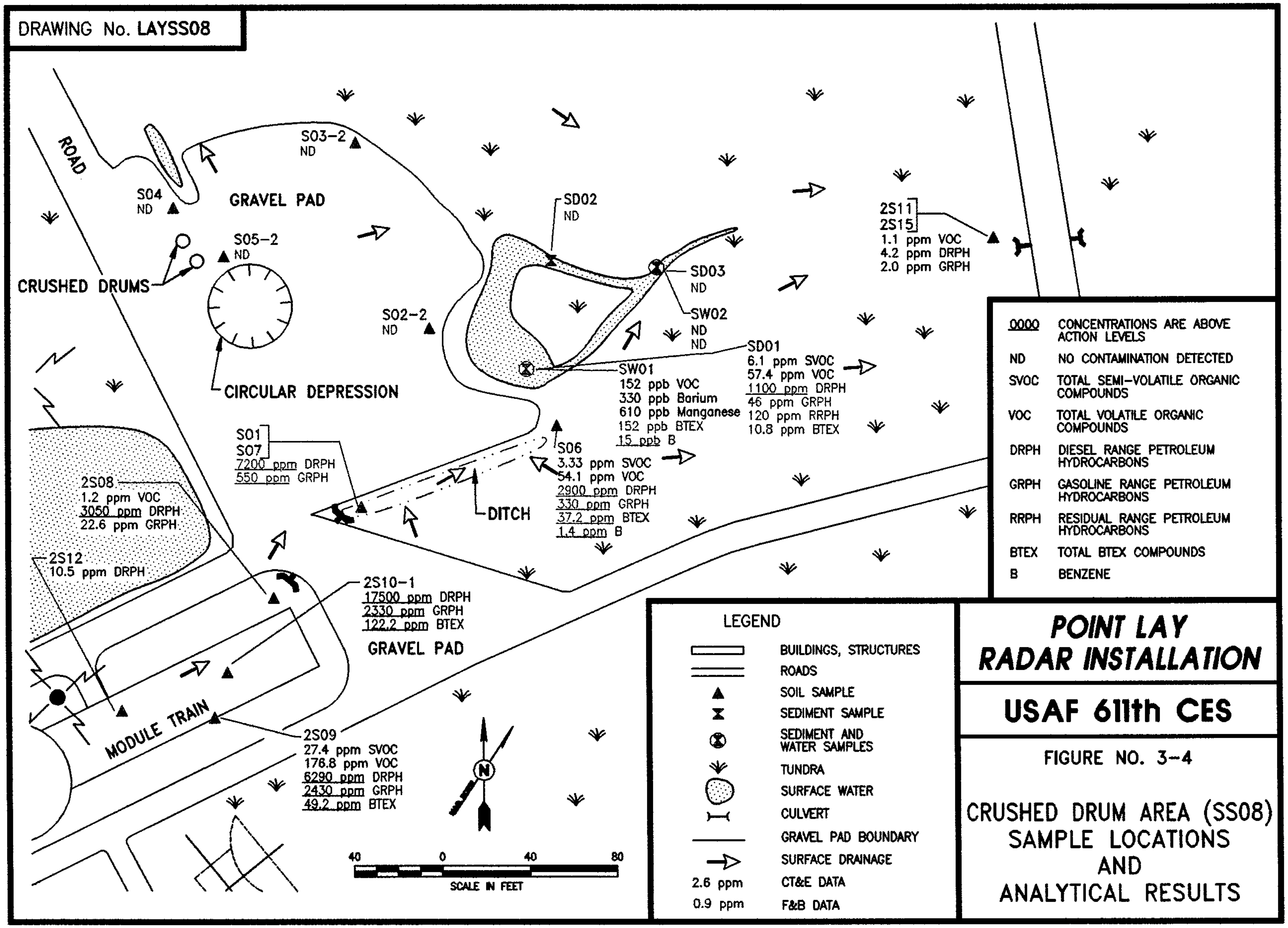
3.4.6 Conclusions and Recommendations

Sampling and analyses have determined that the Crushed Drum Area (SS08) site is contaminated with petroleum hydrocarbons (DRPH, GRPH, and RRPH), and volatile and semi-volatile organics, most of which are common components of diesel fuel. The affected areas at the site are the gravel adjacent to and below the west end of the module train and the tundra along the gravel pad northwest of the module train. The suspected source of contamination is previous spills and/or leaks from the day tanks in the west end of the module train.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current site uses. The potential human health risks at the site are not of a magnitude that normally requires remedial action. The ERA concluded that the overall potential risks presented by site contaminants are minimal. Therefore, under current and future site conditions and considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Levels of petroleum compounds (primarily diesel) detected in soil/sediment at the site exceed ADEC guidance cleanup levels. In addition, site contaminants have migrated downgradient of the site, and have impacted gravel, tundra areas, and surface water. Therefore, the site is being recommended for remedial action. The affected area at the site is the gravel area below, and adjacent to, the west end of the module train and the tundra along the gravel pad northwest of the module train. The remedial action alternative recommended for the tundra and soil beneath the building is enhanced bioremediation. A complete description and evaluation of the remedial alternatives considered for this site are presented in the FS, Section 4.0.

THIS PAGE INTENTIONALLY LEFT BLANK


DRAWING No. LAYSS08
ROAD
GRAVEL PAD
S03-2 ND
S04 ND
S05-2 ND
CRUSHED DRUMS
CIRCULAR DEPRESSION
S02-2 ND
SD02 ND
SD03 ND
SW02 ND ND
SW01
152 ppb VOC
330 ppb Barium
610 ppb Manganese
152 ppb BTEX
15 ppb B
SD01
6.1 ppm SVOC
57.4 ppm VOC
1100 ppm DRPH
46 ppm GRPH
120 ppm RRPH
10.8 ppm BTEX
2S11
2S15
1.1 ppm VOC
4.2 ppm DRPH
2.0 ppm GRPH
S01
S07
7200 ppm DRPH
550 ppm GRPH
S06
3.33 ppm SVOC
54.1 ppm VOC
2900 ppm DRPH
330 ppm GRPH
37.2 ppm BTEX
1.4 ppm B
DITCH
2S08
1.2 ppm VOC
3050 ppm DRPH
22.6 ppm GRPH
2S12
10.5 ppm DRPH
2S10-1
17500 ppm DRPH
2330 ppm GRPH
122.2 ppm BTEX
GRAVEL PAD
MODULE TRAIN
2S09
27.4 ppm SVOC
176.8 ppm VOC
6290 ppm DRPH
2430 ppm GRPH
49.2 ppm BTEX
N
40 0 40 80
SCALE IN FEET
0000 CONCENTRATIONS ARE ABOVE ACTION LEVELS
ND NO CONTAMINATION DETECTED
SVOC TOTAL SEMI-VOLATILE ORGANIC COMPOUNDS
VOC TOTAL VOLATILE ORGANIC COMPOUNDS
DRPH DIESEL RANGE PETROLEUM HYDROCARBONS
GRPH GASOLINE RANGE PETROLEUM HYDROCARBONS
RRPH RESIDUAL RANGE PETROLEUM HYDROCARBONS
BTEX TOTAL BTEX COMPOUNDS
B BENZENE
LEGEND
BUILDINGS, STRUCTURES
ROADS
SOIL SAMPLE
SEDIMENT SAMPLE
SEDIMENT AND WATER SAMPLES
TUNDRA
SURFACE WATER
CULVERT
GRAVEL PAD BOUNDARY
SURFACE DRAINAGE
2.6 ppm CT&E DATA
0.9 ppm F&B DATA
POINT LAY
RADAR INSTALLATION
USAF 611th CES
FIGURE NO. 3-4
CRUSHED DRUM AREA (SS08)
SAMPLE LOCATIONS
AND
ANALYTICAL RESULTS

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY

Installation: Point Lay Matrix: Soil
Site: Crushed Drum Area (SS08) Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples: S01 & S07 (Replicates)		Environmental Samples: S02-2	Environmental Samples: S03-2	Environmental Samples: S04	Environmental Samples: S05-2	Environmental Samples: S06	Field Blanks: AB01	Field Blanks: EB01	Field Blanks: TB01	Lab Blanks	
Laboratory Sample ID Numbers					417	429	419	421	423	425	427 4327-2	4356-5	443/446 4328-2	441 4328-1	#5-82593 #3&4-82493 4356 4328	#5-82493 #1&2-82493 #3&4-82793 4327
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	5	50	500[a]	<50[b]-<100[b]	7,200[b]	7,200[b]	<50[b]	<50[b]	<50[b]	<50[b]	2,900[b]	NA	<1,000[b]	NA	<1,000	<50
GRPH	0.2	2	100	<3J[b]-<4J[b]	550J[b]	470J[b]	<2J[b]	<2J[b]	<2J[b]	<2J[b]	330J[b]	NA	<50J[b]	<50J[b]	<100J	<2J
RRPH (Approx.)	10	100	2,000[a]	<100	<100	<100	<100	<100	<100	<100	<100	NA	<2,000	NA	<2,000	<100
BTEX (8020/ 8020 Mod.)			10 Total BTEX	<0.13-<0.20	33.08R	49.7R	<0.1	<0.1	<0.1	<0.1	37.2J					
Benzene	0.002	0.02	0.5	<0.02-<0.04	0.28R	<0.02	<0.02	<0.02	<0.02	<0.02	1.4	<1[c]	<1	<1	<1	<0.02
Toluene	0.002	0.02		<0.02-<0.04	1.8R	1.7R	<0.02	<0.02	<0.02	<0.02	2.8	<1[c]	<1	<1	<1	<0.02
Ethylbenzene	0.002	0.02		<0.03-<0.04	12R	14R	<0.02	<0.02	<0.02	<0.02	11J	<1[c]	<1	<1	<1	<0.02
Xylenes (Total)	0.004	0.04		<0.04-<0.08	19R	34R	<0.04	<0.04	<0.04	<0.04	22J	<2[c]	<2	<2	<2	<0.04
HVOC 8010	0.002	0.02		<0.03-<0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NA	<1	<1	<1	<0.02J
VOC 8260																
n-Butyl-benzene	0.020	0.250		<0.030-<0.150	NA	NA	NA	NA	NA	NA	4.95	<1	<1	<1	<1	<0.020
sec-Butyl-benzene	0.020	0.250		<0.030-<0.150	NA	NA	NA	NA	NA	NA	1.98	<1	<1	<1	<1	<0.020
Ethylbenzene	0.020	0.250		<0.030-<0.150	NA	NA	NA	NA	NA	NA	1.55	<1	<1	<1	<1	<0.020
Isopropyl-benzene	0.020	0.250		<0.030-<0.150	NA	NA	NA	NA	NA	NA	1.18	<1	<1	<1	<1	<0.020

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
R Result has been rejected.
a The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Matrix: Soil
Site: Crushed Drum Area (SS08) Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples							Field Blanks			Lab Blanks	
					S01 & S07 (Replicates)		S02-2	S03-2	S04	S05-2	S06	AB01	EB01	TB01		
Laboratory Sample ID Numbers					417	429	419	421	423	425	427 4327-2	4356-5	443/446 4328-2	441 4328-1	#5-82593 #3&4-82493 4356 4328	#5-82493 #1&2-82493 #3&4-82793 4327
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
p-Isopropyl-toluene	0.020	0.250		<0.030-<0.150	NA	NA	NA	NA	NA	NA	1.94	<1	<1	<1	<1	<0.020
Naphthalene	0.020	0.250		<0.030-<0.150	NA	NA	NA	NA	NA	NA	4.94	<1	<1	<1	<1	<0.020
n-Propyl-benzene	0.020	0.250		<0.030-<0.150	NA	NA	NA	NA	NA	NA	3.09	<1	<1	<1	<1	<0.020
Toluene	0.020	0.250		<0.030-<0.150	NA	NA	NA	NA	NA	NA	1.60	<1	<1	<1	<1	<0.020
1,2,4-Trimethyl-benzene	0.020	0.250		<0.030-<0.150	NA	NA	NA	NA	NA	NA	16.1	<1	<1	<1	<1	<0.020
1,3,5-Trimethyl-benzene	0.020	0.250		<0.030-<0.150	NA	NA	NA	NA	NA	NA	6.82	<1	<1	<1	<1	<0.020
Xylenes (Total)	0.040	0.500		<0.060-<0.300	NA	NA	NA	NA	NA	NA	9.91	<2	<2	<2	<2	<0.040
SVOC 8270																
Naphthalene	0.200	0.230		<6.90-<15.0	NA	NA	NA	NA	NA	NA	2.05	NA	<36	NA	<10	<0.200
2-Methyl-napthalene	0.200	0.230		<6.90-<15.0	NA	NA	NA	NA	NA	NA	1.28	NA	<36	NA	<10	<0.200
Pesticides	0.002-0.05	0.02-0.5		<0.02J-<0.5J	<0.02J-<0.5J	<0.2J-<0.5J	NA	NA	NA	NA	NA	NA	<02J-<50J	NA	<0.02J-<0.5J	NA
PCBs	0.01	0.1	10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<2	NA	<0.1	<0.1-<0.5

□ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Crushed Drum Area (SS08)
Matrix: Soil
Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples 2S08	2S09	2S10-1	2S11 & 2S15 (Replicates)		2S12	Field Blanks AB01	2EB03	2TB03	Lab Blanks	
Laboratory Sample ID Numbers					4693-1	4693-4	4693-5	4693-8	4693-10	4693-9	4356-5	4692-17	4692-16	4356 4692	4693
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	4.00	4.00	500[a]	<50[b]-<100[b]	3,050	6,290	17,500	<4.00	4.19[d]	10.5[d]	NA	NA	NA	NA	<4.00
GRPH	0.400	0.400-0.500	100	<3J[b]-<4J[b]	22.6	2,430	2,330	<0.500	1.97	<0.500	NA	NA	NA	NA	<0.400
BTEX (8020/8020 Mod.)			10 Total BTEX	<0.13-<0.20	NA	NA	122.2	<0.125	NA	<0.125					
Benzene	0.020	0.025-4.00	0.5	<0.02-<0.04	NA	NA	<4.00	<0.025	NA	<0.025	<1[c]	<1[c]	<1[c]	<1	<0.020
Toluene	0.020	0.025-4.00		<0.02-<0.04	NA	NA	12.4	<0.025	NA	<0.025	<1[c]	<1[c]	<1[c]	<1	<0.020
Ethylbenzene	0.020	0.025-4.00		<0.03-<0.04	NA	NA	18.2	<0.025	NA	<0.025	<1[c]	<1[c]	<1[c]	<1	<0.020
Xylenes (Total)	0.040	0.050-8.00		<0.04-<0.08	NA	NA	91.6	<0.050	NA	<0.050	<2[c]	<2[c]	<2[c]	<2	<0.040
VOC 8260															
Benzene	0.020	0.020-2.50	0.5	<0.030-<0.150	<0.100J	<2.50	NA	NA	0.021	NA	<1	<1	<1	<1	<0.020
n-Butylbenzene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	11.6	NA	NA	<0.020	NA	<1	<1	<1	<1	<0.020
sec-Butylbenzene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	5.03	NA	NA	<0.020	NA	<1	<1	<1	<1	<0.020
Ethylbenzene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	5.35	NA	NA	0.057	NA	<1	<1	<1	<1	<0.020
Isopropylbenzene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	3.23	NA	NA	<0.020	NA	<1	<1	<1	<1	<0.020
p-Isopropyltoluene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	6.04	NA	NA	<0.020	NA	<1	<1	<1	<1	<0.020
Naphthalene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	26.2	NA	NA	0.100	NA	<1	<1	<1	<1	<0.020

☐ CT&E Data.
■ F&B Data.
NA Not analyzed.
J Result is an estimate.
a The action level for DRPH is based on conversations with ADEC; a final action level has not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.
d The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Matrix: Soil
Site: Crushed Drum Area (SS08) Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples						Field Blanks			Lab Blanks	
					2S08	2S09	2S10-1	2S11 & 2S15 (Replicates)		2S12	AB01	2EB03	2TB03		
Laboratory Sample ID Numbers					4693-1	4693-4	4693-5	4693-8	4693-10	4693-9	4356-5	4692-17	4692-16	4356 4692	4693
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
n-Propylbenzene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	7.88	NA	NA	0.023	NA	<1	<1	<1	<1	<0.020
Toluene	0.020	0.020-2.50		<0.030-<0.150	0.308J	5.72	NA	NA	0.240	NA	<1	<1	<1	<1	<0.020
1,2,4-Trimethylbenzene	0.020	0.020-2.50		<0.030-<0.150	0.264J	48.0	NA	NA	0.142	NA	<1	<1	<1	<1	<0.020
1,3,5-Trimethylbenzene	0.020	0.020-2.50		<0.030-<0.150	0.153J	19.6	NA	NA	0.054	NA	<1	<1	<1	<1	<0.020
Xylenes (Total)	0.040	0.040-5.00		<0.060-<0.300	0.490J	38.1	NA	NA	0.500	NA	<2	<2	<2	<2	<0.040
SVOC 8270															
Acenaphthene	0.200	0.220-2.28		<6.90-<15.0	NA	1.85J	NA	NA	<0.220	NA	NA	NA	NA	<10	<0.200
di-n-Butylphthalate	0.200	0.220-2.28	8,000	<6.90-<15.0	NA	8.48B	NA	NA	1.95B	NA	NA	NA	NA	<10	2.31
Dibenzofuran	0.200	0.220-2.28		<6.90-<15.0	NA	1.83J	NA	NA	<0.220	NA	NA	NA	NA	<10	<0.200
Fluorene	0.200	0.220-2.28		<6.90-<15.0	NA	1.95J	NA	NA	<0.220	NA	NA	NA	NA	<10	<0.200
2-Methyl-naphthalene	0.200	0.220-2.28		<6.90-<15.0	NA	11.7	NA	NA	<0.220	NA	NA	NA	NA	<10	<0.200
Naphthalene	0.200	0.220-2.28		<6.90-<15.0	NA	7.66	NA	NA	<0.220	NA	NA	NA	NA	<10	<0.200
Phenanthrene	0.200	0.220-2.28		<6.90-<15.0	NA	2.44	NA	NA	<0.220	NA	NA	NA	NA	<10	<0.200

☐ CT&E Data.
NA Not analyzed.
B The analyte was detected in the associated blank.
J Result is an estimate.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Crushed Drum Area (SS08)
Matrix: Sediment
Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples SD01	SD02	SD03	Field Blanks AB01	EB01	TB01	Lab Blanks	
Laboratory Sample ID Numbers					463 4327-1	465	467	4356-5	443/446 4328-2	441 4328-1	#5-82593 #3&4-82493 4328 4356	#5-82593 #1&2-82493 #3&4-82793 4327
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
DRPH	20	200	500[a]	<50[b]-<100[b]	1,100[b]	<700[b]	<200[b]	NA	<1,000[b]	NA	<1,000	<50
GRPH	0.2	2	100	<3J[b]-<4J[b]	46J[b]	<2J[b]	<2J[b]	NA	<50J[b]	<50J[b]	<100J	<2J
RRPH (Approx.)	40-150	400-1,500	2,000[a]	<100	120	<1,500	<400	NA	<2,000	NA	<2,000	<100
BTEX (8020/8020 Mod.)			10 Total BTEX	<0.13-<0.20	10.83J	<1.44	<0.4					
Benzene	0.002-0.029	0.02-0.29	0.5	<0.02-<0.04	0.23J	<0.29	<0.08	<1[c]	<1	<1	<1	<0.02
Toluene	0.002-0.029	0.02-0.29		<0.02-<0.04	1	<0.29	<0.08	<1[c]	<1	<1	<1	<0.02
Ethylbenzene	0.002-0.029	0.02-0.29		<0.03-<0.04	1.9	<0.29	<0.08	<1[c]	<1	<1	<1	<0.02
Xylenes (Total)	0.004-0.058	0.04-0.58		<0.04-<0.08	7.7J	<0.57	<0.16	<2[c]	<2	<2	<2	<0.04
HVOC 8010	0.002-0.029	0.02-0.29		<0.03-<0.04	<0.02J	<0.29	<0.08	NA	<1	<1	<1	<0.02J
VOC 8260												
n-Butylbenzene	0.020	0.250		<0.030-<0.150	3.66J	NA	NA	<1	<1	<1	<1	<0.020
sec-Butylbenzene	0.020	0.250		<0.030-<0.150	1.51J	NA	NA	<1	<1	<1	<1	<0.020
Ethylbenzene	0.020	0.250		<0.030-<0.150	2.30J	NA	NA	<1	<1	<1	<1	<0.020
Isopropylbenzene	0.020	0.250		<0.030-<0.150	1.34J	NA	NA	<1	<1	<1	<1	<0.020

□ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
a The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay   Matrix: Sediment
Site: Crushed Drum Area (SS08)   Units: mg/kg

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples			Field Blanks			Lab Blanks	
					SD01	SD02	SD03	AB01	EB01	TB01		
Laboratory Sample ID Numbers					463 4327-1	465	467	4356-5	443/446 4328-2	441 4328-1	#5-82593 4328 4356	#5-82593 #1&2-82493 4327
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	mg/kg
p-Isopropyltoluene	0.020	0.250		<0.030-<0.150	1.45J	NA	NA	<1	<1	<1	<1	<0.020
Naphthalene	0.020	0.250		<0.030-<0.150	8.10J	NA	NA	<1	<1	<1	<1	<0.020
n-Propylbenzene	0.020	0.250		<0.030-<0.150	2.81J	NA	NA	<1	<1	<1	<1	<0.020
Toluene	0.020	0.250		<0.030-<0.150	2.11J	NA	NA	<1	<1	<1	<1	<0.020
1,2,4-Trimethylbenzene	0.020	0.250		<0.030-<0.150	13.9J	NA	NA	<1	<1	<1	<1	<0.020
1,3,5-Trimethylbenzene	0.020	0.250		<0.030-<0.150	5.31J	NA	NA	<1	<1	<1	<1	<0.020
Xylenes (Total)	0.040	0.500		<0.060-<0.300	14.87J	NA	NA	<2	<2	<2	<2	<0.040
SVOC 8270												
Benzyl Alcohol	0.200	0.240		<6.90-<15.0	0.680	NA	NA	NA	<36	NA	<10	<0.200
Naphthalene	0.200	0.240		<6.90-<15.0	2.02	NA	NA	NA	<36	NA	<10	<0.200
2-Methylnapthalene	0.200	0.240		<6.90-<15.0	2.43	NA	NA	NA	<36	NA	<10	<0.200
Phenanthrene	0.200	0.240		<6.90-<15.0	0.661	NA	NA	NA	<36	NA	<10	<0.200
Fluoranthene	0.200	0.240		<6.90-<15.0	0.261	NA	NA	NA	<36	NA	<10	<0.200
PCBs	0.01-0.15	0.1-1.5	10	<0.1	<0.1	<1.5	<0.4	NA	<2	NA	<10	<0.1

□ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Crushed Drum Area (SS08)
Matrix: Soil/Sediment
Units: mg/kg
METALS ANALYSES

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Samples							Field Blank			Lab Blanks
					S06	SD01							EB01		
Laboratory Sample ID Numbers					4327-2	4327-1							4328-2		4328 4327
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg							µg/L		µg/L
Aluminum	0.35	2		1,500-23,000	3,400	1,700							<100		<100
Antimony	N/A	56		<7.8-<230	<56J	<56J							<100		<100
Arsenic	0.11	56		<4.9-7.0	<56	<56							<100		<100
Barium	0.024	1		27-390	360	330							<50		<50
Beryllium	N/A	2.8		<2.6-6.4	<2.8	<2.8							<50		<50
Cadmium	0.33	2.8		<3.0-<27	<2.8	<2.8							<50		<50
Calcium	0.69	4		360-59,000	1,200	1,200							<200		<200
Chromium	0.066	1		<4.3-47	6.7	4.7							<50		<50
Cobalt	N/A	5.6		<5.1-12	<5.6	<5.6							<100		<100
Copper	0.045	1		<2.7-45	8.6	7.1							<50		<50
Iron	0.50	2		5,400-35,000	23,000	21,000							<100		<100
Lead	0.13	5.6		<5.1-22	<5.6	<5.6							<100		<100
Magnesium	0.96	4		360-7,400	1,600	920							<200		<200
Manganese	0.025	1		25-290	220J	200J							<50		<50
Molybdenum	N/A	2.8		<2.5-<11	<2.8	<2.8							<50		<50
Nickel	0.11	1		4.2-46	15	13							<50		<50
Potassium	23	100		<300-2,200	590	420							<5,000		<5,000

☐ CT&E Data.
N/A Not available.
J Result is an estimate.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Crushed Drum Area (SS08)

Matrix: Soil/Sediment
Units: mg/kg

METALS ANALYSES

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Samples							Field Blank			Lab Blanks
					S06	SD01							EB01		
Laboratory Sample ID Numbers					4327-2	4327-1							4328-2		4328 4327
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg							µg/L		µg/L
Selenium	1.2	2-56		<7.8-<170	17J	<56							<100		<100
Silver	0.53	28		<3-<110	<28R	<28R							<50J		<50
Sodium	0.55	5		<160-680	94	87							<250		<250
Thallium	0.011	0.28-0.29		<0.2-<0.82	<0.28	<0.29							<5		<5
Vanadium	0.036	1		6.3-59	19	13							<50		<50
Zinc	0.16	1		9.2-95	37	44							<50		<50

☐ CT&E Data.
J Result is an estimate.
R Result has been rejected.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Crushed Drum Area (SS08)
Matrix: Surface Water
Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples					Field Blanks			Lab Blanks
					SW01	SW02				AB01	EB02	TB02	
Laboratory Sample ID Numbers					573/576 4356-6	577/578 4356-7				4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L				µg/L	µg/L	µg/L	µg/L
DRPH	100	1,000		<1,000[b]	<1,000[b]	<1,000[b]				NA	<1,000[b]	NA	<1,000
GRPH	10	100		<50J[b]	<100J[b]	<100J[b]				NA	<100J[b]	<100J[b]	<100J
RRPH (Approx.)	200	2,000		<2,000	<2,000	<2,000				NA	<2,000	NA	<2,000
BTEX (8020/8020 Mod.)													
Benzene	0.1	1	5	<1	15	<1				<1[c]	<1	<1	<1
Toluene	0.1	1	1,000	<1	43	<1				<1[c]	<1	<1	<1
Ethylbenzene	0.1	1	700	<1	12J	<1				<1[c]	<1	<1	<1
Xylenes (Total)	0.2	2	10,000	<2	82J	<2				<2[c]	<2	<2	<2
HVOC 8010	0.1	1		<1	<1	<1				NA	<1	<1	<1
VOC 8260													
Benzene	1	1	5	<1	7.0	NA				<1	<1	<1	<1
Ethylbenzene	1	1	700	<1	6.5	NA				<1	<1	<1	<1

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.
b DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
c BTEX determined by 8260 method analysis.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Crushed Drum Area (SS08)
Matrix: Surface Water
Units: µg/L

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	Environmental Samples					Field Blanks			Lab Blanks
					SW01	SW02				AB01	EB02	TB02	
Laboratory Sample ID Numbers					573/576 4356-6	577/578 4356-7				4356-5	557/572 4356-2	569 4356-1	#5-82793 4356
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L				µg/L	µg/L	µg/L	µg/L
Isopropylbenzene	1	1		<1	1.2	NA				<1	<1	<1	<1
Naphthalene	1	1		<1	15	NA				<1	<1	<1	<1
n-Propylbenzene	1	1		<1	1.3	NA				<1	<1	<1	<1
Toluene	1	1	1,000	<1	30	NA				<1	<1	<1	<1
1,2,4-Trimethylbenzene	1	1		<1	14	NA				<1	<1	<1	<1
1,3,5-Trimethylbenzene	1	1		<1	11	NA				<1	<1	<1	<1
Xylenes (Total)	2	2	10,000	<2	66	NA				<2	<2	<2	<1
SVOC 8270	10	17		<20-<31	<17	NA				NA	<25	NA	<10
PCBs	0.2	2	0.5	<2	<2	<2				NA	<2	NA	<2J
TOC	5,000	5,000		31,700-40,000	19,600	NA				NA	NA	NA	NA
TSS	100	200		6,000-77,000	23,500	NA				NA	NA	NA	<200
TDS	10,000	10,000		149,000-151,000	596,000J	NA				NA	NA	NA	<10,000

☐ CT&E Data.
▩ F&B Data.
NA Not analyzed.
J Result is an estimate.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Crushed Drum Area (SS08)
Matrix: Surface Water
Units: µg/L
METALS ANALYSES: TOTAL (DISSOLVED)

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Sample							Field Blank			Lab Blank
					SW01								EB02		
Laboratory Sample ID Numbers					4356-6								4356-2		4356
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L								µg/L		µg/L
Aluminum	17.4	100		<100-350 (<100-340)	120 (<100)								<100 (<100)		<100
Antimony	N/A	100	6	<100 (<100)	<100 (<100)								<100 (<100)		<100
Arsenic	5.3	100	50	<100 (<100)	<100 (<100)								<100 (<100)		<100
Barium	1.2	50	2,000	<50-93 (<50-91)	330 (270)								<50 (<50)		<50
Beryllium	N/A	50	4	<50 (<50)	<100 (<50)								<50 (<50)		<50
Cadmium	1.7	50	5	<50 (<50)	<50 (<50)								<50 (<50)		<50
Calcium	34.5	200		4,500-88,000 (4,100-86,000)	57,000 (57,000)								410 (<200)		<200
Chromium	3.29	50	100	<50 (<50)	<50 (<50)								<50 (<50)		<50
Cobalt	N/A	100		<100 (<100)	<100 (<100)								<100 (<100)		<100
Copper	2.3	50	1,300	<50 (<50)	<50 (<50)								<50 (<50)		<50
Iron	25	100		180-2,800 (<100-1,600)	6,300 (<100)								<100 (<100)		<100
Lead	6.6	100	15	<100 (<100)	<100 (<100)								<100 (<100)		<100

☐ CT&E Data.
N/A Not available.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay
Site: Crushed Drum Area (SS08)
Matrix: Surface Water
Units: µg/L
METALS ANALYSES: TOTAL (DISSOLVED)

Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range from 7 DEW Line Installations	Environmental Sample							Field Blank			Lab Blank
					SW01								EB02		
Laboratory Sample ID Numbers					4356-6								4356-2		4356
ANALYSES	µg/L	µg/L	µg/L	µg/L	µg/L								µg/L		µg/L
Magnesium	47.8	200		2,900-53,000 (2,600-54,000)	29,000 (28,000)								<200 (<200)		<200
Manganese	1.24	50		<50-510 (<50-120)	610 (540)								<50 (<50)		<50
Molybdenum	N/A	50		<50 (<50)	<50 (<50)								<50 (<50)		<50
Nickel	5.5	50	100	<50 (<50)	<50 (<50)								<50 (<50)		<50
Potassium	1,154	5,000		<5,000-5,000 (<5,000-5,000)	5,400 (6,100)								<5,000 (<5,000)		<5,000
Selenium	62.4	100	50	<100 (<100)	<100 (<100)								<100 (<100)		<100
Silver	2.6	50	50	<50 (<50)	<50 (<50)J								<50 (<50)		<50
Sodium	27.7	250		8,400-410,000 (8,200-450,000)	28,000 (29,000)								370 (400)		<250
Thallium	0.57	5	2	<5 (<5)	<5 (<5)								<5 (<5)		<5
Vanadium	1.8	50		<50 (<50)	<50 (<50)								<50 (<50)		<50
Zinc	8.2	50		<50-160 (<50)	<50 (<50)								<50 (<50)		<50

☐ CT&E Data.
N/A Not available.
J Result is an estimate.

TABLE 3-8. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE CRUSHED DRUM AREA (SS08)

SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM CONCENTRATION	UNITS	BACKGROUND RANGE	RBSL[a]		ARAR[b]	CHEMICAL OF CONCERN
						CANCER	NON-CANCER		
Crushed Drum Area (SS08)	Soil/Sediment	DRPH	17,500	mg/kg	<50-<100	--	--	500[c]	**Yes**
		GRPH	2,430	mg/kg	<3-<4	--	--	100[c]	**Yes**
		RRPH	120	mg/kg	<100	--	--	2,000[c]	No
		Benzene	1.4	mg/kg	<0.02-<0.04	2.2	--	0.5[c]	**Yes**
		Toluene	12.4	mg/kg	<0.02-<0.04	--	5,400	--	No
		Ethylbenzene	18.2	mg/kg	<0.03-<0.04	--	2,700	--	No
		Xylenes (Total)	91.6	mg/kg	<0.04-<0.08	--	54,000	--	No
		Acenaphthalene	1.85J	mg/kg	<6.9-<15.0	--	--	--	**Yes***
		Benzyl Alcohol	0.680	mg/kg	<6.9-<15.0	--	8,100	--	No
		n-Butylbenzene	11.6	mg/kg	<0.03-<0.150	--	--	--	**Yes***
		sec-Butylbenzene	5.03	mg/kg	<0.03-<0.150	--	--	--	**Yes***
		di-n-Butylphthalate	8.48B	mg/kg	<6.9-<15.0	--	2,700	8,000[d]	No
		Dibenzofuran	1.83J	mg/kg	<6.9-<15.0	--	--	--	**Yes***
		Fluorene	1.95J	mg/kg	<6.9-<15.0	--	1,080	--	No
		Isopropylbenzene	3.23	mg/kg	<0.03-<0.150	--	--	--	**Yes***
		p-Isopropyltoluene	6.04	mg/kg	<0.03-<0.150	--	--	--	**Yes***
		2-Methylnaphthalene	11.7	mg/kg	<6.9-<15.0	--	--	--	**Yes***
		Naphthalene	26.2	mg/kg	<0.03-<0.150	--	1,100	--	No
		Phenanthrene	2.44	mg/kg	<6.9-<15.0	--	--	--	**Yes***
		n-Propylbenzene	7.88	mg/kg	<0.03-<0.150	--	--	--	**Yes***
		1,2,4-Trimethylbenzene	48.0	mg/kg	<0.03-<0.150	--	--	--	**Yes***
		1,3,5-Trimethylbenzene	19.6	mg/kg	<0.03-<0.150	--	--	--	**Yes***
		Aluminum	3,400	mg/kg	1,500-25,000	--	--	--	No
		Barium	360	mg/kg	27-390	--	1,890	--	No
		Calcium	1,200	mg/kg	360-59,000	--	--	--	No

TABLE 3-8. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE CRUSHED DRUM AREA (SS08) (CONTINUED)

SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM CONCENTRATION	UNITS	BACKGROUND RANGE	RBSL[a] CANCER	RBSL[a] NON-CANCER	ARAR[b]	CHEMICAL OF CONCERN
Crushed Drum Area (SS08) (Continued)	Soil/Sediment (Continued)	Chromium	6.7	mg/kg	<4.3-47	--	135	--	No
		Copper	8.6	mg/kg	<2.7-45	--	999	--	No
		Iron	23,000	mg/kg	5,400-35,000	--	--	--	No
		Magnesium	1,600	mg/kg	360-7,400	--	--	--	No
		Manganese	220J	mg/kg	25-290	--	3,780	--	No
		Nickel	15	mg/kg	4.2-46	--	540	--	No
		Potassium	590	mg/kg	<300-2,200	--	--	--	No
		Selenium	17J	mg/kg	<7.8-<170	--	135	--	No
		Sodium	94	mg/kg	<160-680	--	--	--	No
		Vanadium	19	mg/kg	6.03-59	--	189	--	No
		Zinc	44	mg/kg	9.2-95	--	8,100	--	No
	Surface Water[h]	Benzene	15	µg/L	<1	0.617	--	5[e]	**Yes**
		Toluene	43	µg/L	<1	--	96.5	1,000[f]	No
		Ethylbenzene	12J	µg/L	<1	--	158	700[f]	No
		Xylenes (Total)	82J	µg/L	<2	--	7,300	10,000[f]	No
		p-Isopropyltoluene	1.2	µg/L	<1	--	--	--	**Yes***
		Naphthalene	15	µg/L	<1	--	150	-	No
		n-Propylbenzene	1.3	µg/L	<1	--	--	--	**Yes***
		1,2,4-Trimethylbenzene	14	µg/L	<1	--	--	--	**Yes***
		1,3,5-Trimethylbenzene	11	µg/L	<1	--	--	--	**Yes***
		Aluminum	120	µg/L	<100-350	--	--	--	No
		Barium	330	µg/L	<50-93	--	256	2,000[h]	**Yes**
		Calcium	57,000	µg/L	4,500-88,000	--	--	--	No
		Iron	6,300	µg/L	180-2,800	--	--	--	No
		Magnesium	[illegible]00	µg/L	2,900-53,000	--	--	--	No

TABLE 3-8. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE CRUSHED DRUM AREA (SS08) (CONTINUED)

SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM CONCENTRATION	UNITS	BACKGROUND RANGE	RBSL[a]		ARAR[b]	CHEMICAL OF CONCERN
						CANCER	NON-CANCER		
Crushed Drum Area	Surface Water[h]	Manganese	610	µg/L	<50-510	–	18.3	–	**Yes**
(SS08)	(Continued)	Potassium	5,400	µg/L	<5,000-5,000	–	–	–	No
(Continued)		Sodium	28,000	µg/L	8,400-410,000	–	–	–	No

* The COCs selected for the site do not include metals that are considered essential human nutrients or analytes that do not have an RBSL or ARAR; however, these chemicals were discussed in the Point Lay Risk Assessment (U.S. Air Force 1996).
a Risk-Based Screening Level.
b Applicable or Relevant and Appropriate Requirement.
c ADEC 1991.
d 55 FR 30798, Proposed Rule RCRA Corrective Action for SWMUs 40 CFR [Section 264.521 (a)(2)(i-iv)], Health-Based Criteria for Systematic Toxicant.
e MCL, 52 FR 25690.
f MCL, 56 FR 3526 (30 January 1991).
g MCL, 56 FR 30266 (01 January 1991).
h The concentrations reported for metals in surface water are total metals.
B The analyte was detected in the associated blank.
J Result is an estimate.

THIS PAGE INTENTIONALLY LEFT BLANK

4.0 FEASIBILITY STUDY

The purpose of this section is to present the FS of remedial alternatives for the sites at Point Lay radar installation recommended for remedial action. These sites were identified based on the findings of the 1993 RI, reported in Sections 1.0 through 3.0 of this document, and the final Point Lay Risk Assessment (U.S. Air Force 1996). The Point Lay sites recommended for remedial action and covered in this FS are:

- Deactivated Landfill (LF01);
- Garage (SS06);
- Drainage Pathway from POL Tanks (SS07); and
- Crushed Drum Area (SS08).

Complete RI results for these sites are presented in Section 3.0. This FS describes the evaluation of remedial alternatives used as the basis for the selection of the proposed remedial actions for the sites. The four sites investigated during the RI at Point Lay are all recommended for remedial action.

This FS complies with the NCP. It has been streamlined as described in the following section. The remainder of the introduction consists of a discussion of the approach used in development of the FS, including risk management decisions, and an outline of the organization of the FS.

4.0.1 Approach To Feasibility Study

This FS is streamlined as follows to minimize unnecessary evaluation of remedial alternatives for the sites at Point Lay.

- The FS was conducted with the focus on contaminated soil/drums/debris, gravel, soil beneath buildings, and tundra, instead of individual sites.

  It is most practical to remediate the sites together because they are small and impacted by similar types of contamination, and the installation is too remote to do otherwise efficiently.

  Because the soil underneath both the Garage (SS06) and the module train at the Crushed Drum Area (SS08) are similar, they will be remediated as one site using the same remedial alternative. A small amount of contaminated gravel at the Garage (SS06) is also considered to be associated with this medium. Contaminated tundra is associated with two sites, the Garage (SS06) and the Crushed Drum Area (SS08). The same remedial alternative is recommended for the tundra areas at the two sites.

- Repetition of information presented in the RI (Sections 1.0 through 3.0 of this report) and the Point Lay Risk Assessment is minimized. Data essential to evaluating remedial alternatives are presented in summary tables in Section 4.1.

- Remedial action characterization tables recommended in the AFCEE Handbook (U.S. Air Force 1991) have been adapted to focus on the data essential to the evaluation of remedial alternatives. Wherever possible, reference is made to the RI and risk assessment for detailed site information, and assumptions used in calculating risk and identifying COCs.

- General response actions (GRAs) and applicable technologies are screened together, and the alternatives are limited to no more than five conventional and innovative methods including the required no action alternative.

4.0.2 Risk Management Decisions

Based on a thorough review of the data, three risk management decisions were made in writing the FS. These decisions are necessary to focus the results of the RI/FS and risk assessment into workable and protective remedial alternatives.

- Surface water in tundra areas has been affected by contamination at the installation. Methods for remediating surface water directly at the sites are not feasible because it is extremely shallow, covers a wide area, is frozen for over half the year, and is intimately associated with tundra. ADEC recognizes that physical remedial actions in tundra are often more ecologically damaging than the petroleum hydrocarbons (Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Guidance No. 001 - Revision Number 1, July 17, 1991, page 10). Instead of evaluating direct remedial alternatives for surface water in otherwise natural tundra areas, we have taken the approach that remediation of the source will improve the quality of surface water over time.

  This risk management decision permits the focus of the FS to be on cleaning up the sources of contamination at the Point Lay radar installation. The primary contaminant in soil/sediment at the installation is DRPH. Other COCs include GRPH, RRPH, BTEX compounds, and PCE.

- A second risk management decision relates to the Drainage Pathway from POL Tanks (SS07). The contaminated medium is surface water, and the contaminants are petroleum hydrocarbons (DRPH and GRPH), benzene, dichloroethene, cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene. The recommended action is monitoring of surface water to determine if the contaminants detected in surface water were of a short-term extent (caused by painting the POL tanks), or representative of an ongoing release to the environment.

  This site differs from other sites with contaminated surface water in that there is no apparent source to mitigate. The data suggest that the source was a short-term event because contamination appears to be limited to surface runoff (i.e., it is not associated with the soils and sediments). Another round of samples will clarify the situation. If contamination is not detected, no further action should be recommended. If contamination is detected, viable alternatives have been

developed for other sites that could be adjusted to this site. These include institutional controls and monitoring, and an interception trench leading to an oil/water separator and granular activated carbon treatment. The cost for sampling surface water is included in the estimated cost for the recommended alternatives, and is detailed in Attachment A.

- A third risk management decision relates to tetrachloroethene detected in soil/sediment at the Garage (SS06). Although tetrachloroethene is identified as a COC in the risk assessment, it is not considered a COC for the purposes of the FS. The maximum concentration detected (43 mg/kg) is significantly less than the concentration that corresponds to an excess cancer risk of 10-4 (the point at which EPA generally requires remediation action). The maximum concentration is also significantly less than the concentration that corresponds to a hazard quotient of 1. Finally, there is no chemical-specific ARAR. The impact of the preferred remedial alternative on tetrachloroethene is included in Section 4.4.5.

4.0.3 Organization

The FS is organized as follows:

- Introduction;
- Site characterization for remediation (considers COCs, range of concentrations detected, estimated areas and volumes of affected media, ARARs, and target cleanup levels or proposed remediation goals for each site);
- Screening of GRAs and presentation of representative remedial technologies;
- Development of remedial alternatives;
- Detailed evaluation of remedial alternatives (the detailed analysis is based on the AFCEE guidance and includes the nine NCP criteria). The detailed evaluation also includes a comparative analysis of alternatives, and identification of preferred alternatives);
- Siting study; and
- Detailed cost estimates and estimates of project duration in attachments A and B, respectively.

4.1 SITE CHARACTERIZATION FOR REMEDIATION

Information relevant to the screening and evaluation of remedial alternatives for the Deactivated Landfill (LF01), Garage (SS06), and Crushed Drum Area (SS08) is summarized in Tables 4-1

through 4-3. The tables include COCs in site soils/sediments, range of concentrations detected, estimates of volumes of affected media, and the basis for listing each as a COC.

4.1.1 Summary of Site Information

The information considered for each site includes:

- medium;
- COCs;
- range of concentrations detected;
- target cleanup level (or proposed remediation goal - the lowest applicable action level based on the risk assessment including cancer risk, noncancer HQ, and chemical-specific ARARs);
- basis for the target cleanup level (chemical-specific ARAR, cancer risk or noncancer HQ); and
- design parameters for remedial action.

4.1.2 Estimated Areas, Volumes, and Masses of Contaminated Media

The approximate areas, volumes, and masses of the contaminated media at Point Lay are presented in Table 4-4 for use in the medium-specific approach discussed in the introduction. Areas and depths are estimated based on the RI, and the density is estimated to be 1.8 tons/cubic yard. The locations and estimated volumes of contaminated media are illustrated in Figures 4-1 through 4-3. The media include gravel, soil beneath the two structures (garage and module train), tundra, and soil/drums/debris at the landfill. The estimated total volumes of contaminated media are:

- gravel - 45 cubic yards;
- soil beneath buildings - 310 cubic yards;
- tundra - 2,730 cubic yards; and
- soil/drums/debris - 625 cubic yards.

GRAs and remedial alternatives are screened, developed, and evaluated for these media in Sections 4.2 through 4.4.

Estimates of cost and project duration are provided in Attachments A and B, respectively. These attachments are located at the end of Section 4.0.

4.1.3 ARARs

According to the NCP, ARARs must be identified and evaluated to determine all of the requirements for remedial actions. There are three categories of ARARs:

- Chemical-specific;
- Action-specific; and
- Location-specific.

TABLE 4-1. REMEDIAL ACTION CHARACTERIZATION FOR THE DEACTIVATED LANDFILL (LF01)

MEDIA	CONTAMINANTS	RANGE OF ENVIRONMENTAL CONTAMINATION	TARGET CLEANUP LEVEL	BASIS FOR LISTING AS COC	VOLUME OF CONTAMINATED MEDIA	DESIGN PARAMETERS
Soil, drums, and debris and sediment	DRPH[a]	ND - 624 mg/kg[b]	500 mg/kg[c]	ADEC Non-UST Action Level	625 cy	• contaminant concentration • size of debris • volume • desorption potential • incineration potential

a The concentration of DRPH at this site is barely above the ADEC Non-UST action level. The reason LF01 is considered for remedial action is the list of COCs detected in surface water downstream of the site and migrating from the source area. The COCs and their maximum detected concentrations are: tetrachloroethene (109 μg/L), GRPH (223 μg/L), benzene (23 μg/L), dichlorfluoromethane (58 μg/L), and trichloroethene (3.3 μg/L).

b This range reflects contaminant concentrations in sediment samples downstream from the Deactivated landfill (LF01) site. The actual range of contamination at the source area has not yet been determined.

c Target cleanup level for DRPH in soil is based on ADEC Non-UST guidance and does not necessarily correspond to the final site specific cleanup goal.

TABLE 4-2. REMEDIAL ACTION CHARACTERIZATION FOR THE GARAGE (SS06)

MEDIA	CONTAMINANTS	RANGE OF ENVIRONMENTAL CONTAMINATION	TARGET CLEANUP LEVEL[a]	BASIS FOR LISTING AS COC	VOLUME OF CONTAMINATED MEDIA	DESIGN PARAMETERS
Gravel	DRPH	14.4 - 15,200 mg/kg	500 mg/kg	ADEC Non-UST Action Level	45 cy	• microbial activity • oxygen diffusion • contaminant concentration • grain size • seasonal impact
	GRPH	0.607 - 937 mg/kg	100 mg/kg	ADEC Non-UST Action Level		
Soil Underneath Building (soil/gravel)	DRPH	18,000 - 33,400 mg/kg	500 mg/kg	ADEC Non-UST Action Level	150 cy	• accessibility • contaminant concentration • solubility • drainage
	GRPH	25 - 540 mg/kg	100 mg/kg	ADEC Non-UST Action Level		
	RRPH	2,300 - 40,000 mg/kg	2,000 mg/kg	ADEC Non-UST Action Level		
	BTEX	ND - 30.8 mg/kg	10 mg/kg	ADEC Non-UST Action Level		
Tundra (soil/sediment)	DRPH	ND - 12,800 mg/kg	500 mg/kg	ADEC Non-UST Action Level	2,570 cy	• microbial activity • contaminant concentration • soil moisture • nutrient levels • soil pH
	GRPH	ND - 397 mg/kg	100 mg/kg	ADEC Non-UST Action Level		
	RRPH	ND - 12,000 mg/kg	2,000 mg/kg	ADEC Non-UST Action Level		
	BTEX	ND - 60 mg/kg	10 mg/kg	ADEC Non-UST Action Level		

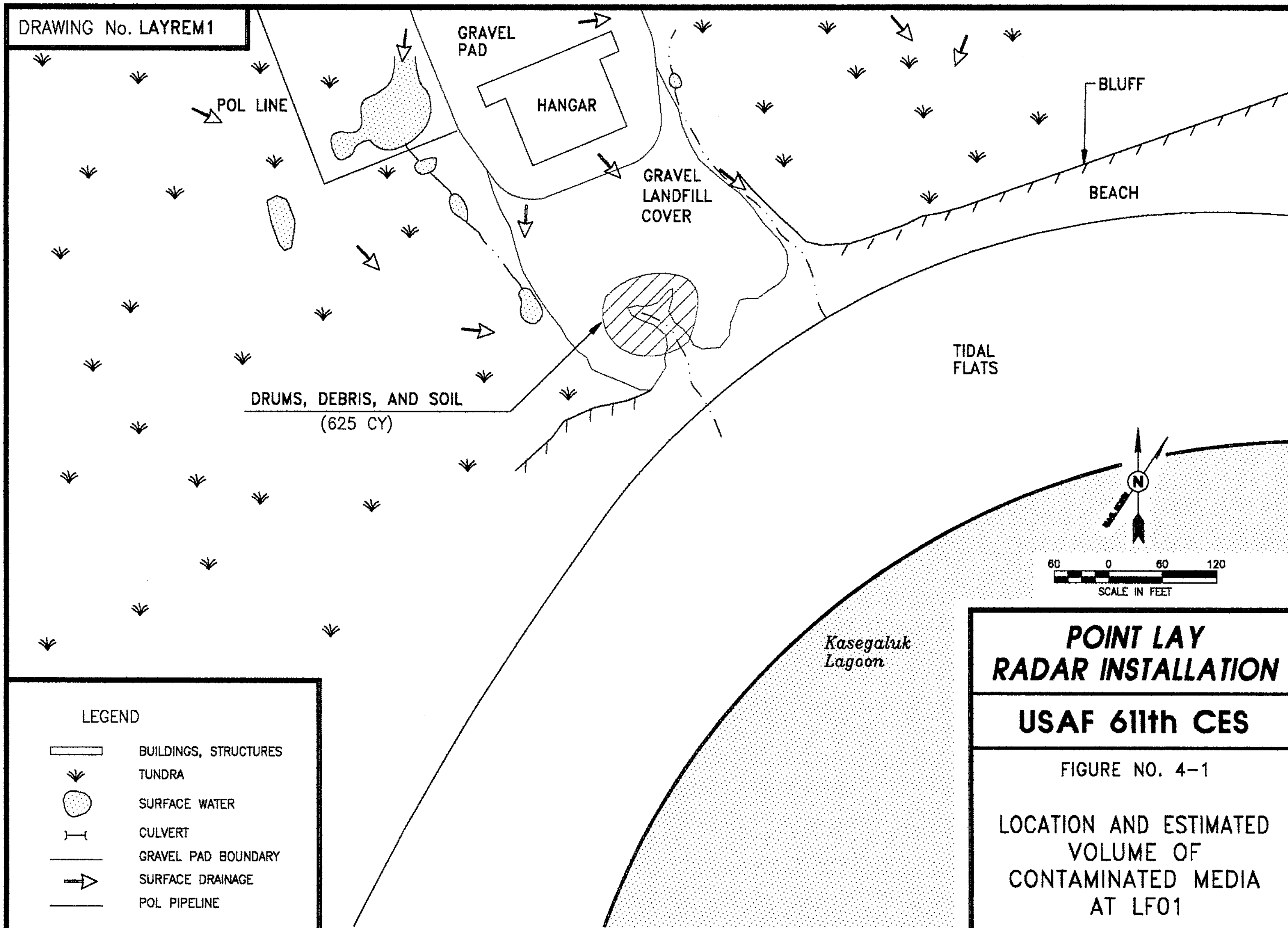
a Target cleanup levels for DRPH, GRPH, RRPH, and BTEX in soil are based on ADEC Non-UST guidance and do not necessarily correspond to final site specific cleanup goals.

TABLE 4-3. REMEDIAL ACTION CHARACTERIZATION FOR THE CRUSHED DRUM AREA (SS08)

MEDIA	CONTAMINANTS	RANGE OF ENVIRONMENTAL CONTAMINATION	TARGET CLEANUP LEVEL[a]	BASIS FOR LISTING AS COC	VOLUME OF CONTAMINATED MEDIA	DESIGN PARAMETERS
Soil Underneath Building (soil/gravel)	DRPH	10.5 - 17,500 mg/kg	500 mg/kg	ADEC Non-UST Action Level	160 cy	• accessibility • contaminant concentration • solubility • drainage
	GRPH	ND - 2,430 mg/kg	100 mg/kg	ADEC Non-UST Action Level		
	BTEX	ND - 122.2 mg/kg	10 mg/kg	ADEC Non-UST Action Level		
Tundra (soil/sediment)	DRPH	ND - 7,200 mg/kg	500 mg/kg	ADEC Non-UST Action Level	160 cy	• microbial activity • contaminant concentration • soil moisture • nutrient levels • soil pH
	GRPH	ND - 550 mg/kg	100 mg/kg	ADEC Non-UST Action Level		
	BTEX	ND - 37.2 mg/kg	10 mg/kg	ADEC Non-UST Action Level		
	Benzene	ND - 1.4 mg/kg	0.5 mg/kg	ADEC Non-UST Action Level		

a Target cleanup levels for DRPH, GRPH, BTEX, and benzene in soil are based on ADEC Non-UST guidance and do not necessarily correspond to final site specific cleanup goals.

THIS PAGE INTENTIONALLY LEFT BLANK



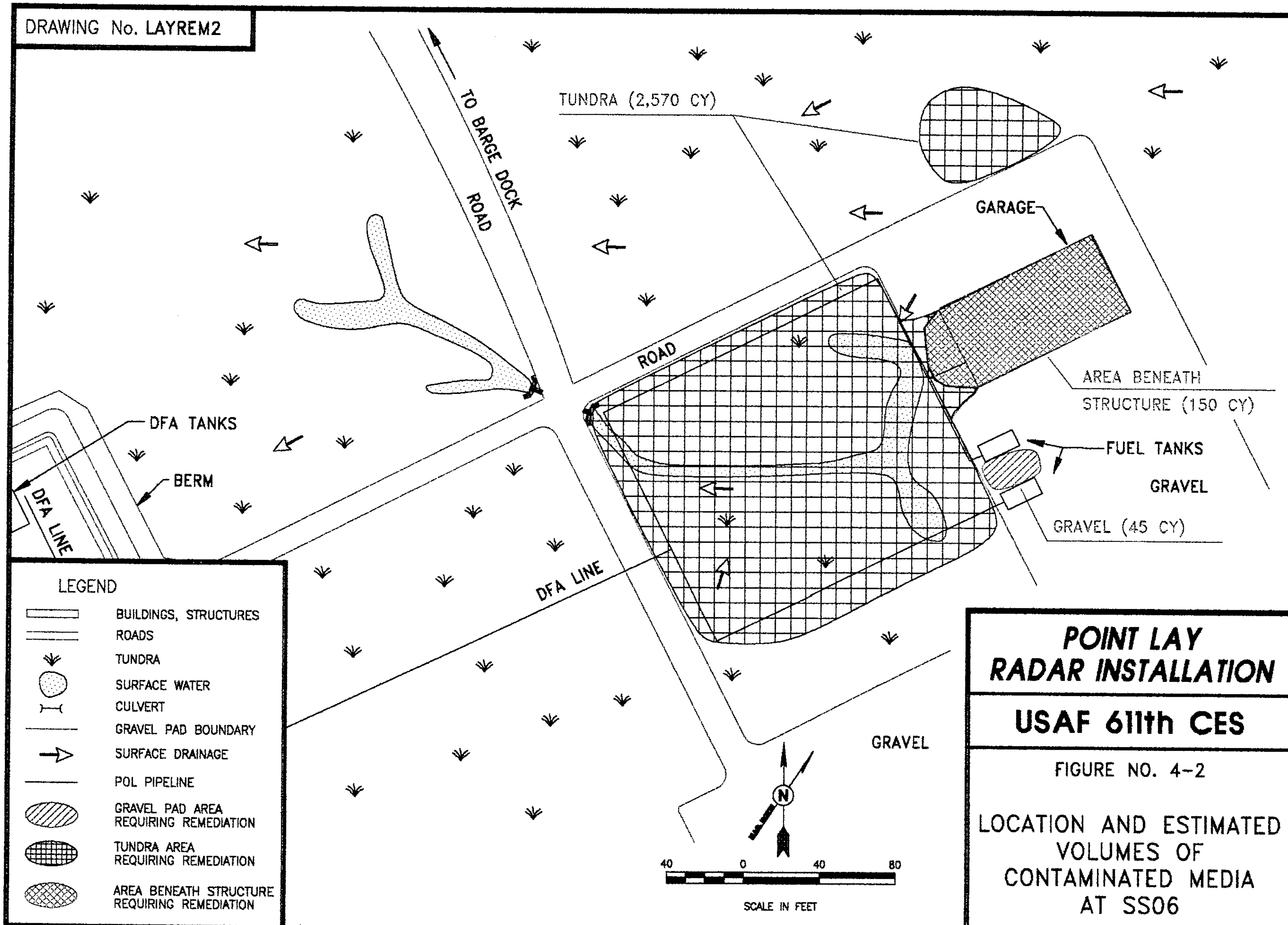
POINT LAY RADAR INSTALLATION

USAF 611th CES

FIGURE NO. 4-1

LOCATION AND ESTIMATED VOLUME OF CONTAMINATED MEDIA AT LF01

THIS PAGE INTENTIONALLY LEFT BLANK



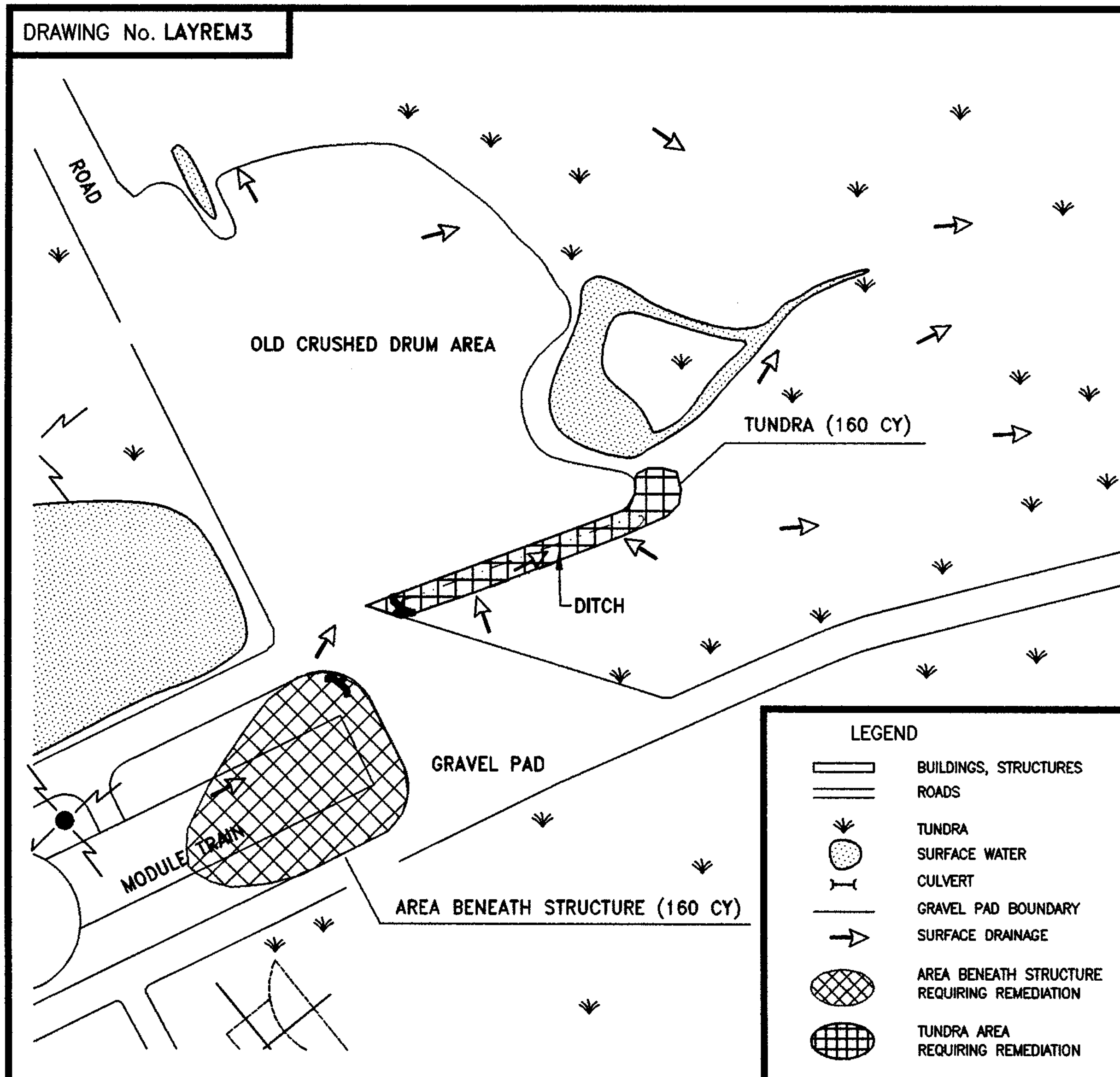
POINT LAY RADAR INSTALLATION

USAF 611th CES

FIGURE NO. 4-2

LOCATION AND ESTIMATED VOLUMES OF CONTAMINATED MEDIA AT SS06

THIS PAGE INTENTIONALLY LEFT BLANK



POINT LAY RADAR INSTALLATION

USAF 611th CES

FIGURE NO. 4-3

LOCATIONS AND ESTIMATED VOLUME OF CONTAMINATED MEDIA AT SS08

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE 4-4. APPROXIMATE AREAS, VOLUMES, AND MASSES OF CONTAMINATED MEDIA BY SITE AT POINT LAY

SITE	MEDIUM	AREA (sq ft)	DEPTH (ft)	VOLUME (cy)	MASS (tons)
Deactivated Landfill (LF01)	soil/drums/debris	5,625	3	625	1,125
Garage (SS06)	gravel	300	4	45	80
	soil beneath building	4,000	1	150	270
	tundra	27,700	2.5	2,570	4,625
Crushed Drum Area (SS08)	soil beneath building	4,400	1	160	290
	tundra	1,730	2.5	160	290

Chemical-specific ARARs are action levels that may apply in addition to risk or hazard-based remediation goals. Chemical-specific ARARs were identified during the RI and included in the risk assessment. The target cleanup levels or proposed remediation goals represent the lowest applicable action level.

Action-specific ARARs are requirements that relate to how remedial actions must be conducted. For example, offsite transportation of hazardous waste must be manifested in compliance with the RCRA requirements.

Location-specific ARARs impose requirements on a remedial action based on the location of the site. For example, there are specific requirements that pertain to wetlands.

It should be noted that ADEC's Interim Guidance for Non-UST contaminated soil target cleanup levels is intended as guidance and does not necessarily correspond to final site-specific cleanup levels. The ARARs for the sites at the Point Lay installation are presented in Table 4-5.

4.2 SCREENING OF GENERAL RESPONSE ACTIONS

4.2.1 Presentation and Screening of General Response Actions

GRAs are general approaches for remedial actions. GRAs can be active or passive measures. Active measures involve removal, active treatment, or isolation of the contaminated media. Passive measures rely on natural processes to reduce the toxicity, mobility, or volume of contamination, or on controls put in place to limit exposure. GRAs apply to contaminants in all of the environmental media separately, or in any combination. Screening GRAs streamlines the FS process by establishing the feasibility of entire classes of remedial responses, thereby enabling the selection of a focused set of viable alternatives for detailed evaluation. GRAs have been evaluated for the four media contaminated at the Point Lay installation: gravel, soil beneath buildings, tundra, and soil/drums/debris.

TABLE 4-5. ARARS FOR SITES AT THE POINT LAY INSTALLATION

AUTHORITY	CITATION	TYPE OF ARAR	BASIS	CATEGORY OF ARAR
Clean Air Act	42 U.S.C. 7401-7642, 40 CFR 60, 61, and 63	Action-specific	National Ambient Air Quality Standards (Treatment technology standards for fugitive emissions and landfills)	Applicable
ADEC, Interim Guidance for Non-UST Action Levels	18 AAC 75.140	Chemical-specific	Standards for general guidance	Relevant and Appropriate
RCRA	40 CFR Part 263	Action-specific	Standards Applicable to Generators of Hazardous Waste	Relevant and Appropriate
RCRA	40 CFR 268	Action-specific	Land Disposal Restrictions	Relevant and Appropriate
ADEC, Interim Guidance for Surface and Groundwater Cleanup Levels	AS 46.03.070, AS 46.09.020, 18 AAC 70.020 (b), AS 46.04.020, 18 AAC 75.140, 18 AAC 70.025, 18 AAC 70.030 18 AAC 70.010, and 18 AAC 70.040	Location-specific	Standards applicable for water used for drinking and surface water important to the growth and propagation of aquatic life	Relevant and Appropriate
ADEC, Interim Guidance for Surface and Groundwater Cleanup Levels	AS 46.03.070 AS 46.09.020 AS 46.04.020 18 AAC 70.020 18 AAC 75.140	Chemical-specific	Standards applicable for water used for drinking and surface water important to the growth and propagation of aquatic life	Relevant and Appropriate
SDWA	52 FR 25690 56 FR 3526	Chemical-specific	Maximum Contaminant Level for drinking water	Relevant and Appropriate
RCRA	55 FR 30798	Chemical-specific	Standard for Solid Waste Management Units, SWMUs, in the RCRA Corrective Action Program	Relevant and Appropriate

The criteria for screening GRAs are implementability, effectiveness, duration, and cost. Implementability is estimated in terms of technical and administrative barriers. For example, containment is generally less acceptable to regulatory agencies than removal or treatment.

Additionally, an innovative technology that has proven to be effective in the continental U.S. may not be implementable on the North Slope because it cannot be transported there.

Duration is the estimate of the time necessary to attain the treatment efficiency estimated from applicable case studies and the literature. The estimated duration of no action that includes passive biodegradation is long even though the time necessary to implement no action is short.

Effectiveness is the relative success of the response action in reducing contamination and risk to acceptable levels.

Cost is the estimated capital, operating, and administrative costs necessary to attain the projected treatment efficiency. This estimate is presented in relative terms (low, medium, and high).

The GRAs considered for the Point Lay installation are:

- No Action;
- Institutional Controls and Monitoring;
- Containment;
- Onsite Treatment; and
- Removal.

These GRAs are defined as follows:

No Action. Under no action, contaminants are left in place, and only natural processes, such as biodegradation, would lower the concentrations of COCs. No action is considered for all four media.

Institutional Controls and Monitoring. Institutional controls and monitoring represent a passive response in which steps are taken to minimize the possibility of accidental exposure of humans and the environment to COCs. Institutional controls may include fencing off an area to minimize exposure and public education to show people how to avoid exposure. Institutional control of sites contaminated by petroleum hydrocarbons minimizes the chances of accidental exposure while passive biodegradation occurs. Monitoring is included to determine if migration of contaminants is occurring and if natural processes are lowering the concentrations of the COCs.

Containment. Containment limits the potential for accidental exposure to contaminants by physical means. Examples include capping soils and using solidification techniques. Objectives can include one or more of the following: 1) minimize the risk of direct exposure to contaminated soils; 2) eliminate the possibility of contaminants or contaminated soils becoming airborne and migrating; and 3) prevent water from entering the contaminated area and transporting contaminants to other areas.

Onsite Treatment. Treatment may be used to reduce the toxicity, mobility, or volume of a contaminant and may be accomplished in situ or ex situ. In situ treatment involves active treatment with the medium in place. Ex situ treatment involves the removal of the contaminated medium, with subsequent treatment at the installation. The medium may be replaced in the original excavation after treatment. Treatment efficiencies vary depending on the technique used and the type of contaminant present.

Removal. Removal involves excavating the contaminated medium and shipping it offsite for treatment and/or disposal. Removal reduces the risk of exposure to the contaminant because it no longer remains at the installation. There is some risk to remedial workers during the excavation and shipping process.

The applicability of these GRAs at Point Lay was determined using AFCEE screening criteria: implementability, project duration, effectiveness, and cost benefit. Representative technologies for the GRAs retained are presented and screened in Section 4.2.2. Screening was performed as follows.

4.2.1.1 Screening of GRAs for Soil, Drums, and Debris. GRAs considered for remediation of the soils, drums, and debris at the Deactivated Landfill (LF01) are presented in Table 4-6. No action, onsite treatment, and removal are retained for evaluation.

4.2.1.2 Screening of GRAs for Soil Beneath Buildings and Associated Gravel. Because the volume of gravel is relatively small when compared to the volume of the soil beneath buildings (15 percent), it may be addressed by the same GRAs and technologies. The gravel medium has been combined with soil beneath buildings to streamline the evaluation of remedial alternatives. GRAs considered for remediation of the soil beneath buildings (principally disturbed soil, tundra) and the limited volume of adjacent gravel are presented in Table 4-7. No action, institutional controls and monitoring, containment, and onsite treatment are retained for evaluation.

4.2.1.3 Screening of GRAs for Contaminated Tundra. GRAs considered for remediation of tundra are presented in Table 4-8. No action, institutional controls and monitoring, and onsite treatment are retained for evaluation.

4.2.2 Presentation of Technologies

This section describes remedial technologies considered for use at the Point Lay installation based on the retained GRAs. The selected technologies have all been effective in the Alaskan environment. Conditions at Point Lay, including the arctic climate and remote location, exclude many technologies that could be considered for sites in a more temperate location.

TABLE 4-6. SCREENING OF GENERAL RESPONSE ACTIONS FOR REMEDIAL ALTERNATIVES EVALUATED FOR THE SOIL, DRUMS, AND DEBRIS AT DEACTIVATED LANDFILL (LF01)

GENERAL RESPONSE ACTION	REPRESENTATIVE TECHNOLOGIES	PROJECTED TREATMENT EFFICIENCY	RETAINED OR REJECTED	RATIONALE
No action	• No action	0 percent*	Retained	Implementability: Low Duration: Short Effectiveness: Low Cost: Low Retained/Rejected: Retained (requirement of NCP).
Institutional controls and monitoring	• Monitoring • Public education • Fencing	0 percent*	Rejected	Implementability: Low Duration: Moderate Effectiveness: Low Cost: Low Retained/Rejected: Rejected due to low implementability and low effectiveness.
Containment	• Solidification • Capping	90 percent reduction in mobility	Rejected	Implementability: Low Duration: Long Effectiveness: Low Cost: Moderate Retained/Rejected: Rejected due to low implementability, low effectiveness, and long duration.
Onsite treatment	• Thermal desorption	100 percent	Retained	Implementability: Moderate Duration: Long Effectiveness: High Cost: High Retained/Rejected: Retained due to moderate implementability and high effectiveness.
Removal	• Offsite incineration	100 percent	Retained	Implementability: Moderate Duration: Short to moderate Effectiveness: High Cost: High Retained/Rejected: Retained due to moderate implementability, high effectiveness, and short to moderate duration.

* Some attenuation may occur due to dilution or volatilization that is not considered treatment efficiency for the purpose of this FS.

TABLE 4-7. SCREENING OF GENERAL RESPONSE ACTIONS FOR REMEDIAL ALTERNATIVES EVALUATED FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL

GENERAL RESPONSE ACTION	REPRESENTATIVE TECHNOLOGIES	PROJECTED TREATMENT EFFICIENCY	RETAINED OR REJECTED	RATIONALE
No action	• No action	50 percent	Retained	Implementability: Moderate Duration: Short project duration, long to achieve bioremediation goals. Effectiveness: Moderate Cost: Low Retained/Rejected: Retained (requirement of NCP).
Institutional controls and monitoring	• Monitoring • Public education • Fencing	50 percent	Retained	Implementability: High Duration: Moderate project duration, long to achieve bioremediation goals. Effectiveness: Moderate Cost: Low Retained/Rejected: Retained due to moderate effectiveness, high implementability, and low cost.
Containment	• Maintenance of freezing conditions	90 percent reduction in mobility	Retained	Implementability: Moderate Duration: Long Effectiveness: High Cost: Low to Moderate Retained/Rejected: Retained due to high effectiveness, high implementability, and low to moderate cost.
Onsite treatment	• Enhanced bioremediation • Biosurfactants	90 to 94 percent	Retained	Implementability: Moderate Duration: Short to Long Effectiveness: Moderate to High Cost: Moderate Retained/Rejected: Retained due to moderate implementability and moderate to high effectiveness.
Removal	• Offsite incineration	100 percent	Rejected	Implementability: Low Duration: Short Effectiveness: High Cost: High Retained/Rejected: Rejected due to low implementability and high cost.

TABLE 4-8. SCREENING OF GENERAL RESPONSE ACTIONS FOR REMEDIAL ALTERNATIVES EVALUATED FOR TUNDRA

GENERAL RESPONSE ACTION	REPRESENTATIVE TECHNOLOGIES	PROJECTED TREATMENT EFFICIENCY	RETAINED OR REJECTED	RATIONALE
No action	• No action	50 percent	Retained	Implementability: Moderate Duration: Short project duration long to achieve bioremediation goals. Effectiveness: Moderate Cost: Low Retained/Rejected: Retained (requirement of NCP).
Institutional controls and monitoring	• Monitoring • Public education • Fencing	50 percent	Retained	Implementability: High Duration: Moderate project duration, long to achieve bioremediation goals. Effectiveness: Moderate Cost: Low Retained/Rejected: Retained due to high implementability, moderate effectiveness, and low cost.
Containment	• Solidification • Capping	80 percent reduction in mobility	Rejected	Implementability: Moderate Duration: Long Effectiveness: Low Cost: Moderate Retained/Rejected: Rejected due to moderate implementability, low effectiveness, and long duration.
Onsite treatment	• Enhanced bioremediation	94 percent	Retained	Implementability: High Duration: Short to Long Effectiveness: Moderate to High Cost: Moderate Retained/Rejected: Retained due to high implementability and moderate to high effectiveness.
Removal	• Offsite incineration	100 percent	Rejected	Implementability: Low Duration: Short to Moderate Effectiveness: High Cost: High Retained/Rejected: Rejected due to low implementability and high cost.

The remedial technologies under consideration for the contaminated media at the Point Lay radar installation are presented in this section as follows:

No Action

- No action

Institutional Controls and Monitoring

- Institutional controls and monitoring (i.e., monitoring, public education, fencing)

Containment

- Containment by maintenance of freezing conditions

Onsite Treatment

- Thermal desorption
- Biosurfactants
- Enhanced bioremediation

Removal

- Offsite incineration

All of the technologies presented above have been applied effectively at sites on the North Slope or elsewhere in Alaska. In addition to being effective in cold climates, they are well-suited to the short summer season, the only favorable time for outdoor remedial activities, and the remote location where there is little or no staffing for year-round operation and maintenance of remedial systems. Specifically, these remedial technologies are either short-term actions completed in one season (approximately 100 days) with imported labor, or longer term actions that are self-sustaining and require minimal labor.

Several of the retained remedial technologies involve bioremediation, which can be accomplished on the North Slope with psychrophilic (i.e., cold weather) microorganisms and fungi, both indigenous and imported. Bioremediation has been documented on the North Slope and elsewhere in Alaska, but is subject to several limiting factors including:

- availability of nutrients and oxygen;
- short periods of thaw; and
- percentage of fine-grained materials.

Biodegradation can generally be estimated in terms of first order kinetics, where the only rate limiting factor is the biodegradation potential, which is a function of the factors listed above. With first order kinetics, a given target cleanup level will eventually be reached regardless of the initial concentration; however, as the gap between initial and target concentrations widens or rate

limiting factors become more significant, the time necessary to reach the target increases exponentially because the function plots symptomatically with concentration. A more detailed discussion of the estimates of biodegradation is presented in Section 4.4.

Descriptions of the selected technologies that have been retained are presented in the following subsections.

4.2.2.1 No Action. No action is a required alternative of the NCP, the purpose of which is to provide a baseline for assessment of other alternatives. No action consists of passive bioremediation at sites where COCs are biodegradable. Natural unassisted bioremediation typically takes longer than assisted enhanced bioremediation. The rate of biodegradation, especially in the North Slope region, is reduced because of short warm seasons and prolonged harsh winters.

4.2.2.2 Institutional Controls and Monitoring. This technology involves no active treatment; taking advantage instead of the natural biodegradation that occurs in arctic soil (Atlas 1985). Natural bioremediation typically takes longer than enhanced bioremediation. The rate of biodegradation, especially in the North Slope region, is reduced because of short warm seasons and prolonged harsh winters. Public education and fencing off the affected area would constitute institutional controls, and monitoring would include sampling and analysis of any associated surface water and soil/sediment.

Institutional controls and monitoring are being evaluated for the petroleum-related contaminants in gravel, tundra, and soil beneath buildings. The case studies used to support biodegradation-based alternatives are used to estimate rates of bioremediation.

4.2.2.3 Containment by Maintenance of Freezing Conditions (Containment). The contaminated soil beneath the structures at the Garage (SS06) and the Crushed Drum Area (SS08) represents a difficult remedial problem because the Air Force does not intend to raze the structures at this time. The vertical access is insufficient to manually remove the contaminated soil or to use equipment to do so. Attempts to flush the contamination introduce issues related to the control of runoff and the potential loss of structural integrity of the piles on which the structures rest due to melting of permafrost. The latter may not be the primary concern because the piles are set very deeply. One solution is to maintain freezing conditions under the buildings year round to keep contaminants locked in ice or frozen ground. The undersides of the structures are relatively cold year round because they remain shaded during the summer. Examples of cold containment include insulation with gravel cover and heat exchangers (or a combination of the two). Once the building is dismantled, the contaminated soil can be excavated and managed appropriately. The containment alternative is not appropriate for the associated contaminated gravel pad at the Garage (SS06) site.

4.2.2.4 Thermal Desorption. One of the technologies under the onsite treatment GRA is thermal desorption. This technology involves moderate temperature treatment (200-500°F) of the contaminated media. Contaminants are not destroyed, but are instead vaporized, condensed, then collected. If the condensed material is prohibited from land disposal under 40 CFR 268, it must be treated to meet the treatment standards for hazardous wastes, which in this

case is incineration. Thermal desorption may be conducted onsite. Condensed liquids that are restricted from land disposal must be sent offsite for incineration at a RCRA permitted facility. There may be difficulties in treating bulky materials, such as drums and debris, therefore, those must be segregated before treatment. Figure 4-4 is the process flow diagram of excavation, thermal desorption, and offsite incineration.

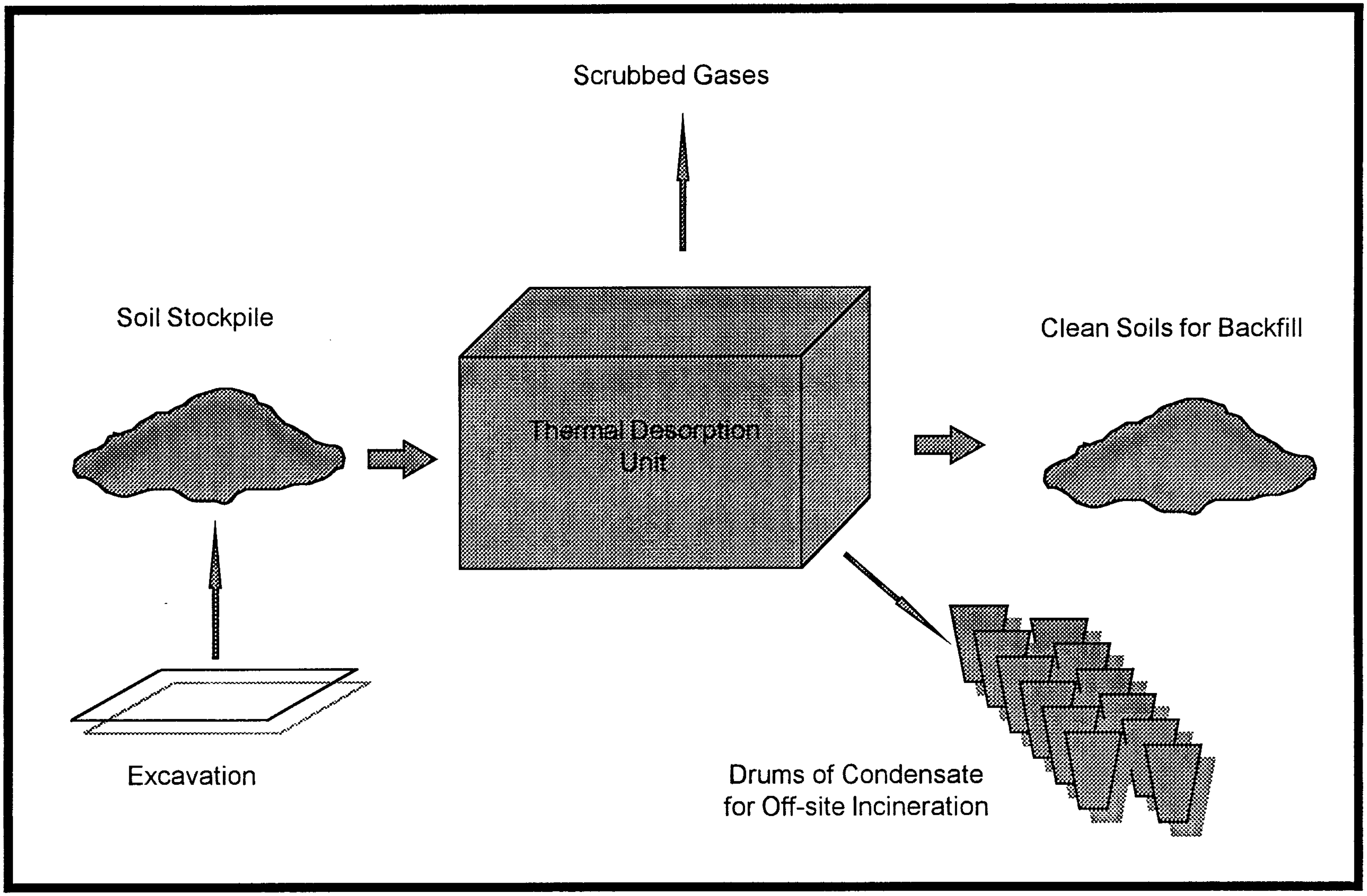
4.2.2.5 Enhanced Bioremediation. One of the technologies under the onsite treatment GRA is enhanced bioremediation. Enhanced bioremediation in this FS involves delivering water and nutrients to the contaminated soils in place to assist natural bioremediation. Several organisms that can utilize the carbon in petroleum are indigenous to the North Slope, including *Bacillus cereus, Bacillus polymixa, Arthrobacter globiformis,* and *Alcaligenes poradoxus* (Ratcliff 1993). In addition, several strains of pseudomonas bacteria (psychrophilic genera) decreased TPH concentration in tundra during the summer season in the Prudhoe Bay area (Jorgenson et al. 1992). A case study conducted at Point Thompson, Alaska suggests that this approach is feasible for remediation of gravel pads if a cultured population of microbes is used (Liddell et al. 1991). The cultured population could be either indigenous or exotic. A treatability study will be necessary to determine how best to bioremediate each of the media.

Variations in temperature affect the rate of biodegradation by bacteria. In the arctic environment, bacteria remain active enough to consume petroleum hydrocarbon molecules from June through August when temperatures are warmest. Successful biodegradation of petroleum hydrocarbon contaminants in soil by indigenous bacteria is possible at the ambient arctic summer temperatures (Evans, Elder, and Hoffman 1992). A study at Surfcote Pad in the Prudhoe Bay area (Evans, Elder, and Hoffman 1992) indicates that native microbial populations are capable of bioremediating diesel-contaminated gravel at an appreciable rate during the short summer season. In the arctic environment at a depth of three feet, microbial populations can effectively consume hydrocarbon products (Atlas 1985); however, the number and activity of bacteria decrease with an increase in depth because of lower temperatures and reduced levels of oxygen and nutrients.

Enhanced bioremediation is being evaluated for the soil beneath the buildings and for open tundra. Oxygenated water that has been warmed to offset the cold and nutrients may be applied to contaminated soil beneath buildings to provide conditions necessary for bioremediation. In the open tundra, the water does not need to be warmed because heat is provided by the sun. Water and nutrients would be added intermittently based on the results of a treatability study. This process may not generate runoff. Nonetheless, a wastewater discharge permit may be required. Precautions will also be taken to contain any runoff that occurs. Figure 4-5 is a process flow diagram of enhanced bioremediation.

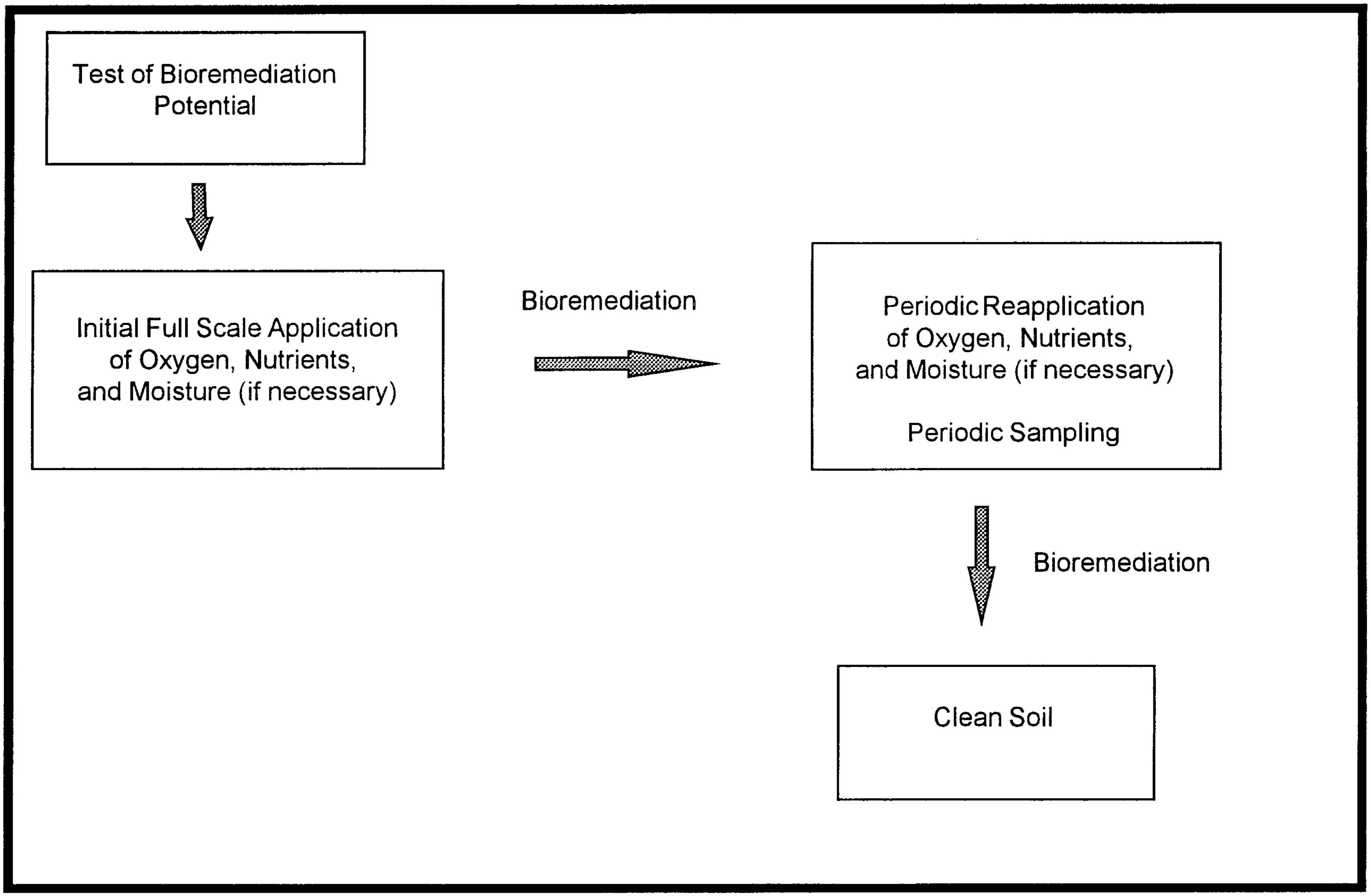
4.2.2.6 Biosurfactants. One of the technologies under the onsite treatment GRA is biosurfactants. Biosurfactants have been used to remove hydrocarbons from contaminated soils and gravels. Biosurfactants are products of bacterial fermentation, and may include sugars, fats, and proteins. They act by attaching to and surrounding hydrocarbon molecules thus detaching them from soil particles. Biosurfactants do not alter the structure of the hydrocarbons, but render them temporarily inert, preventing them from reattaching to soil particles and allowing their removal from soils by flushing with water. The flush water mixture is then collected and the

Figure 4-4: Thermal Desorption and Off-Site Incineration Process Flow Diagram



THIS PAGE INTENTIONALLY LEFT BLANK

Figure 4-5: Enhanced Bioremediation Process Flow Diagram



THIS PAGE INTENTIONALLY LEFT BLANK

biosurfactant-hydrocarbon mixture, which floats on water, is removed by skimming. The collected mixture is bioremediated onsite in an aerated tank spiked with nutrients.

This technology is being evaluated for treating DRPH, GRPH, RRPH, and BTEX in the soil beneath buildings that is difficult to remediate in traditional ways. It is readily available in Alaska, and involves using high intensity "air knives" to jet the biosurfactant into the material being remediated. It is anticipated from the results of the site investigations that contamination beneath the Garage and module train is limited to a very shallow depth (<1 foot bgs) by permafrost close to the surface. The "air knives" can probably penetrate far enough to mobilize all of the contaminants. After the biosurfactant is applied, the medium will be flushed with water to remove the mix of hydrocarbons and surfactant. The flush water mixture will be collected from existing drainage pathways and pumped to a tank or series of drums for bioremediation. Recirculation will keep the volume of water low. Figure 4-6 is a process flow diagram of the biosurfactants technology.

4.2.2.7 Offsite Incineration. The technology considered in this FS under the removal GRA is offsite incineration. This technology involves removal and high temperature treatment of the contaminated media. It is being evaluated for the soil/drums/debris at the Deactivated Landfill (LF01). Contaminants are transformed into non-hazardous combustion byproducts, mostly water and carbon dioxide. Additional byproducts are non-combustible materials in the media including metallic debris. Incineration of regulated waste is performed at an appropriate RCRA permitted facility.

4.3 DEVELOPMENT OF REMEDIAL ALTERNATIVES

4.3.1 Approach to Developing Remedial Alternatives

The remedial technologies selected in Section 4.2.2 represent the GRAs retained in Section 4.2.1. In this section remedial technologies are developed into alternatives designed to address site-specific COCs. Because the alternatives are designed around the combined media (e.g., soil beneath buildings), rather than specific sites, one remedial technology is sufficient to define an alternative that can be applied to different sites. Alternatives developed in this section are evaluated in the detailed evaluation of remedial alternatives in Section 4.4, and evaluated with respect to the NCP's nine criteria in Section 4.4.4.

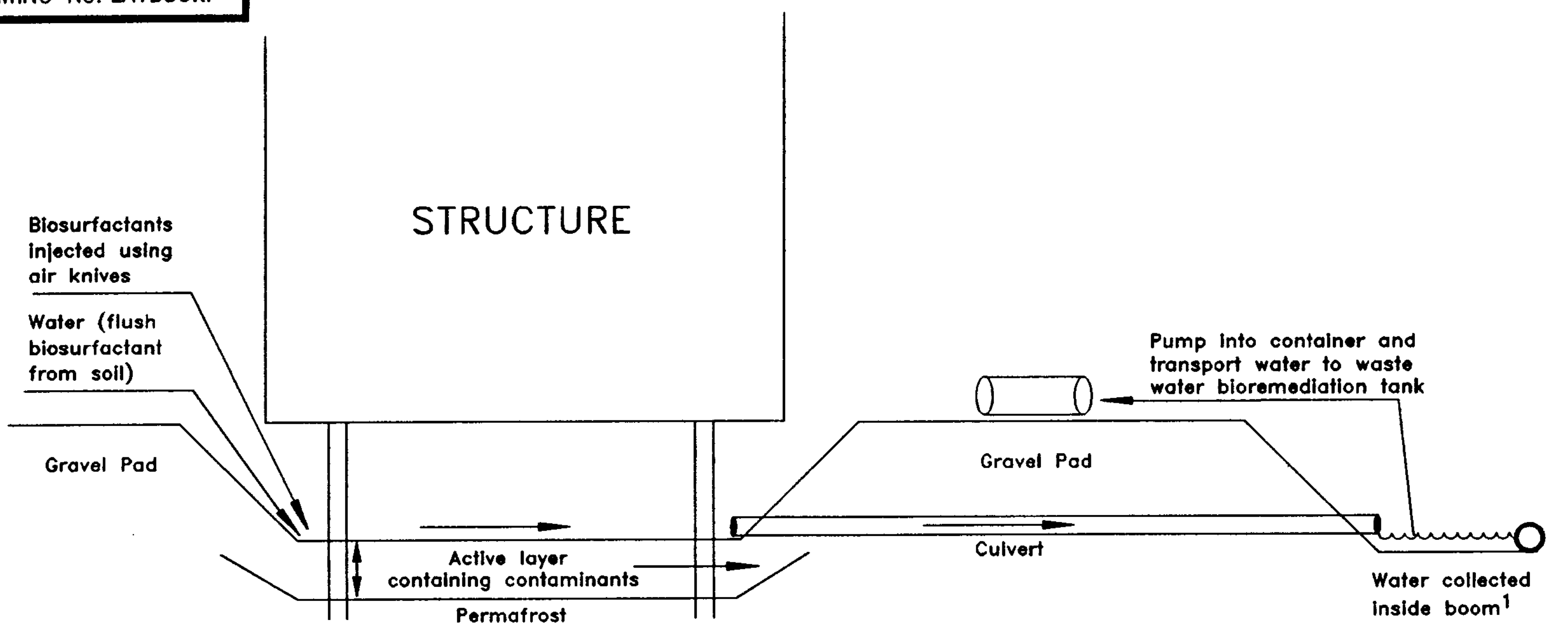
This section is organized by remedial alternative; the rationale for development and a list of applicable sites and media are included. Remedial alternatives are summarized in Table 4-9 at the end of the section. The technologies are described in Section 4.2 and are not discussed further in this section.

4.3.1.1 No Action.

Rationale for Development. No action provides a baseline against which other alternatives are compared. It is a required alternative according to the NCP. Natural attenuation of petroleum

THIS PAGE INTENTIONALLY LEFT BLANK

DRAWING No. LAYBSURF



1. Booms and other collection materials will be tested and disposed of offsite.

POINT LAY RADAR INSTALLATION	FIGURE NO. 4-6
USAF 611th CES	APPLICATION OF BIOSURFACTANTS PROCESS FLOW DIAGRAM

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE 4-9. SUMMARY OF REMEDIAL ALTERNATIVES BY MEDIUM

MEDIA	SITES	REMEDIAL ALTERNATIVES
Soil, drums, and debris	Deactivated Landfill (LF01)	No action Thermal desorption Offsite incineration
Soil beneath buildings and associated gravel	Garage (SS06) Crushed Drum Area (SS08)	No action Institutional controls and monitoring Containment[a] Enhanced bioremediation Biosurfactants
Tundra	Garage (SS06) Crushed Drum Area (SS08)	No action Institutional controls and monitoring Enhanced bioremediation

[a] Containment applies to soil beneath buildings only. The remedial alternative for the small volume of associated gravel would be institutional controls and monitoring.

hydrocarbons will occur through biodegradation if microbial populations and conditions (e.g., water, oxygen, temperature, and nutrients) are present that facilitate aerobic biodegradation.

Applicable Media and Sites.

- Soil, drums, and debris: Deactivated Landfill (LF01).
- Soil beneath buildings and associated gravel: Garage (SS06) and Crushed Drum Area (SS08).
- Tundra: Garage (SS06) and Crushed Drum Area (SS08).

4.3.1.2 Institutional Controls and Monitoring.

Rationale for Development. This limited action alternative is applicable to all of the media because currently the COCs do not pose a significant cancer risk or noncancer hazard. Natural attenuation of petroleum hydrocarbons may occur through biodegradation if microbial populations and conditions (e.g., water, oxygen, temperature, and nutrients) are present that facilitate aerobic biodegradation.

Institutional controls considered include public education and fencing off the affected area. Monitoring would be performed periodically to ensure that contaminants are biodegrading and are not migrating offsite, and that the quality of surface water where surface water contamination has been observed is improving.

Applicable Media and Sites.

- Soil beneath buildings and associated gravel: Garage (SS06) and Crushed Drum Area (SS08)
- Tundra: Garage (SS06) and Crushed Drum Area (SS08)

4.3.1.3 Containment.

Rationale for Development. The soil beneath the buildings at the Garage (SS06) and the Crushed Drum Area (SS08) pose several technical problems because the Air Force has no immediate plans to dismantle the buildings. Vertical access is insufficient for conventional excavation. Containment by maintenance of freezing conditions could be an effective way to prevent the migration of contaminants until the building is dismantled or a highly effective remedial technology becomes available. Human exposure would be very limited because of the low vertical clearance. Several methods exist for maintaining freezing conditions beneath buildings in arctic climates. Methods include insulation, heat exchangers, or a combination of the two. This alternative applies to soil beneath the buildings only. Monitoring will verify the effectiveness of the remediation action.

The associated gravel at the Garage (SS06) site would not be contained in this manner. Instead, because of its small volume, institutional controls and monitoring would be employed as the remedial alternative. Monitoring would be concurrent with monitoring of the contained soils beneath the buildings.

Applicable Media and Sites.

- Soil beneath the buildings at the Garage (SS06) and Crushed Drum Area (SS08)

4.3.1.4 Enhanced Bioremediation.

Rationale for Development. This is a low maintenance method for reducing petroleum concentrations in tundra, soils beneath buildings, and associated gravel. Enhanced bioremediation in this FS is assisted (i.e., enhanced natural bioremediation). The assistance is low level, and includes the addition of appropriate amounts of nutrients, lime, and moisture, and the assumption that sufficient oxygen is present to support aerobic metabolism of hydrocarbons. This alternative is more aggressive than natural, unassisted attenuation, yet can be designed to limit disturbance of the tundra and permafrost. A treatability study will be necessary to demonstrate site-specific viability of this alternative. For example, the percentage of fine-grained soils in the associated gravel will affect its ability to retain moisture and organic carbon.

Monitoring will verify the progress of the process.

Applicable Media and Sites.

- Soil beneath buildings and associated gravel: Garage (SS06) and Crushed Drum Area (SS08).
- Tundra: Garage (SS06) and Crushed Drum Area (SS08).

4.3.1.5 Biosurfactants.

Rationale for Development. This method worked for removing petroleum hydrocarbons from shallow soils, hard surfaces, and rocks following the Valdez oil spill. It is applicable to soils beneath buildings and associated gravel. Use of biosurfactants is also feasible for the small volume of gravel associated with the Garage (SS06) because the runoff can be contained. Alternatively, the gravel could be excavated, treated using biosurfactants, and replaced.

Monitoring will verify the effectiveness of the remedial action.

Applicable Media and Sites.

- Soil beneath buildings and associated gravel: Garage (SS06) and Crushed Drum Area (SS08).

4.3.1.6 Thermal Desorption.

Rationale for Development. This alternative will significantly reduce the amount of material to be incinerated by liquefying and removing contaminants from the soil, drums, and debris. Thermally desorbed soil would be reintroduced to the excavation. This alternative includes offsite incineration of the condensate from the thermal desorption process at a facility permitted under RCRA to treat wastes regulated by land disposal restrictions (40 CFR 268). Mobile thermal desorption units can be transported to Point Lay.

Applicable Medium and Sites.

- Soil, drums, and debris: Deactivated Landfill (LF01)

4.3.1.7 Offsite Incineration.

Rationale for Development. This alternative will result in the physical removal of contaminated soil/sediment to an offsite incinerator for destruction. This is an established treatment for wastes regulated by the land disposal restrictions (40 CFR Part 268) such as spent tetrachloroethene, which is an F-listed solvent under RCRA (40 CFR Part 261.31).

Applicable Media and Sites.

- Soil, drums, and debris: Deactivated Landfill (LF01).

4.4 DETAILED EVALUATION OF REMEDIAL ALTERNATIVES

4.4.1 Approach

The alternatives developed in Section 4.3 are evaluated in this section using the suggested criteria in the AFCEE Guidance for remedial alternative evaluation. These five criteria are defined in Sections 4.4.1.1 through 4.4.1.5. The detailed evaluation of alternatives is conducted in Section 4.4.2 and summarized in Section 4.4.3. The alternatives are evaluated with respect to NCP's nine criteria in Section 4.4.4. Preferred alternatives are presented in Section 4.4.5.

4.4.1.1 Successful Application Of The Technology Under Site Conditions. This criterion requires the location and approximate date of the applications, the managing entity, and a presentation of successful applications of the given alternative under conditions similar to those found at the Point Lay installation. Case studies conducted on the Alaskan North Slope are used to the extent possible.

4.4.1.2 Total Project Cost. The total cost of performing the remedial alternative is estimated and divided into technology testing, capital, total labor, operating, environmental testing, closure, and indirect costs.

For the purpose of this evaluation, the itemized cost elements are defined as follows:

- Technology testing costs consist of pilot tests or treatability studies;
- Capital costs include equipment or materials purchased;
- Total labor costs include the labor required for operating and maintaining the remedial action system, oversight, project management, and development of planning documents;
- Operating costs include costs other than labor associated with operating remedial systems (e.g., thermal desorption) and earth moving;
- Environmental testing costs are for sampling and analysis, including periodic monitoring, and monitoring associated with site closure; and
- Closure costs related to reporting associated with site closure.

4.4.1.3 Contaminant Reduction. The reduction in concentration of each COC may be projected for each medium and site based on case-study derived efficiencies. This reduction, referred to as post-remedial concentration, is listed with the initial concentration and target cleanup level. Post-remedial concentration is a more useful measure of the effectiveness than risk reduction for the remedial alternatives at the Point Lay installation as none of the COCs are included because of elevated cancer risk or noncancer hazard. Risks or hazards, therefore, are not the indicators of successful remediation. Post-remedial concentration is applicable to target cleanup concentrations set by regulations and/or cleanup guidance.

The concentrations presented in this section are defined as follows:

Initial Concentration. This is the maximum initial concentration of the COC detected.

Target Cleanup Level. This is the cleanup level specified for the given COC (the basis for which is presented in Tables 4-1 to 4-3).

Post Remedial Concentration. This is the estimated final concentration of the COC based on remedial efficiencies from case studies. References to these case studies can be found in Sections 4.4.2.1 through 4.4.2.3, subsection A, successful applications of alternatives. Estimated remedial efficiencies presented apply to all organic COCs for thermal desorption and biosurfactants. For enhanced bioremediation, institutional controls and monitoring, and no action, the estimated remedial efficiencies are based on DRPH. Specific estimated efficiencies used are presented below. The estimates are independent of time (over the short term, e.g., one year, natural biodegradation would be significantly less efficient than active remedial alternatives like offsite incineration).

The following remedial efficiencies are used for detected petroleum hydrocarbons and the assumed source of COCs in surface water (listed in a footnote to Table 4-1) at the Deactivated Landfill (LF01) at the Point Lay installation:

- Biosurfactants - 90 percent
- Thermal Desorption - 100 percent
- Offsite Incineration - 100 percent

The following remedial efficiencies are used for DRPH, GRPH, RRPH, and BTEX compounds at the Point Lay installation:

- Institutional controls and monitoring; and no action - 50 percent
  (Natural unassisted bioremediation)
- Enhanced bioremediation - 94 percent
  (depending on the range of boiling points of the hydrocarbons in the RRPH present at these sites and the class of compound, RRPH could biodegrade similarly or more slowly than DRPH)

The post-remedial concentration is estimated using the following formula:

Post-remedial Concentration = Initial Concentration x (1 - Remedial Efficiency)

4.4.1.4 Project Duration. The estimated duration of each of the remedial alternatives and associated project schedules is an important consideration because of the seasonal limitations on outdoor work and the lack of personnel to perform operation and maintenance activities in this remote location. The North Slope of Alaska is frozen and covered with snow and ice for the majority of the year, leaving a period of only approximately 100 days in the summer when the weather is favorable for outdoor work, especially remedial alternatives involving excavation and flowing water. Outdoor phases of remedial actions significantly longer than 100

days must be suspended until the following summer, causing a marked increase in duration because of the extended winter down time. In order to maximize efficiency, remedial alternatives were designed either to complete outdoor phases of remediation within this narrow time frame or extend over a longer term and require only minimal labor.

Project durations are based on case studies from Alaska. The rates of biological degradation for enhanced bioremediation and natural unassisted bioremediation associated with no action institutional controls and monitoring are expressed as a decay function. The first-order decay function used to model this biological degradation is $C = C_0 e^{-kt}$ (C is final concentration, C_0 is the initial concentration, e is the natural logarithm, k is a constant based on case studies, and t is time).

The rate constant, k, is estimated based on related case studies. In general, the k-values presented reflect the lower end of the expected range of values. These values are then downwardly adjusted because of the arctic environment conditions. The lowest rates are associated with no action and institutional controls and monitoring because there is no enhancement of conditions. Enhanced bioremediation has the highest rate because more factors are optimized. The following constants and criteria were used for estimation of remedial rates:

DRPH Reduction

No action and institutional controls and monitoring (Natural unassisted bioremediation) $k = 0.0025$/day

The k-value for no action and institutional controls and monitoring is based on rate data from a control cell in an experiment to measure the effectiveness of enhanced bioremediation (Liddell et al. 1991). The case study k-value was decreased in an attempt to offset the bias that aeration of the control cell introduces.

Enhanced bioremediation $k = 0.008$/day

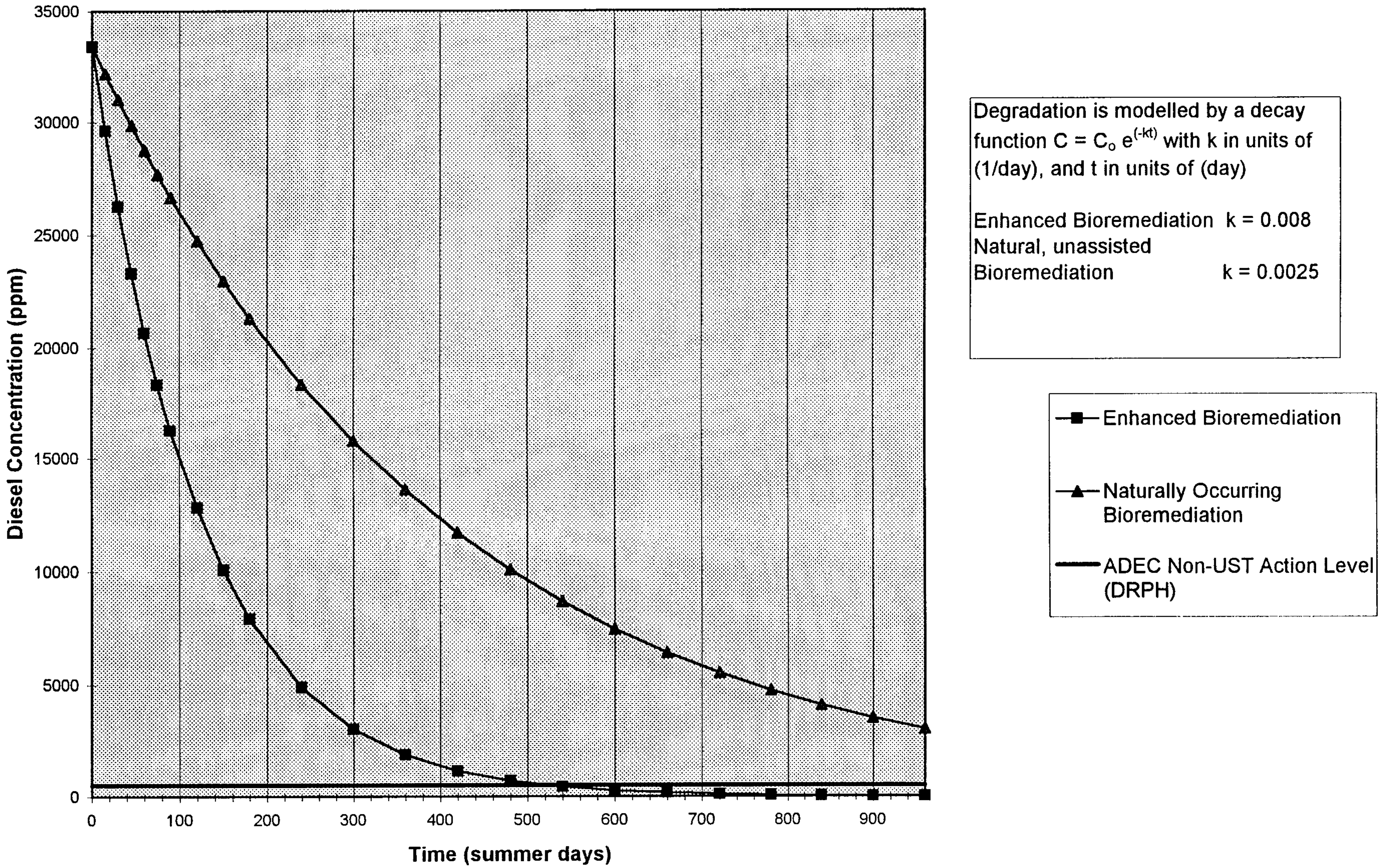
This rate is based on a number of case studies, and represents a downward adjustment of the low end of the range of decay constants observed. Many of the case studies took place under temperate climatic conditions.

A comparison of the predicted degradation of DRPH using the three bioremedial technologies being evaluated is illustrated in Figure 4-7 (no action and institutional controls and monitoring are both represented by natural unassisted bioremediation).

The duration of onsite remedial activity and the total project duration are presented in Attachment B. These durations are defined as follows:

- Duration of onsite remedial activity includes all onsite activities related to conducting the remedial action: sampling, operating remedial equipment, time required for adding nutrients to soil, mobilization, and demobilization (this is a quantification of the relative duration estimate).

Figure 4-7. Comparative Biodegradation of Diesel Fuel in Soils
(Basis: Maximum Diesel Concentration of 33,400 ppm at Point Lay)



THIS PAGE INTENTIONALLY LEFT BLANK

- Total project duration includes the duration of onsite remedial activity, as well as time required for preparing planning documents, conducting permitting activities, and closure.

4.4.1.5 Data Gaps. Data gaps include any environmental testing or treatability studies that must be done to determine the effectiveness of a given remedial alternative under site conditions.

Alternatives are analyzed comparatively in Sections 4.4.3 and 4.4.4 based on the AFCEE criteria above, and the nine criteria in the NCP, respectively. The preferred remedial alternatives are identified in Section 4.4.5.

4.4.2 Detailed Evaluation of Alternatives for Soil, Drums, and Debris; Soil Beneath Buildings; and Tundra

This section presents a detailed evaluation of remedial alternatives for soil, drums, and debris; soil beneath buildings; and tundra.

4.4.2.1 Soil, Drums, and Debris.

Alternatives considered for treatment of the soil, drums, and debris at the Deactivated Landfill (LF01) at Point Lay are:

- No action;
- Thermal desorption; and
- Offsite incineration.

A. Successful Applications of Alternatives

No Action. The landfill is a source for downstream contamination. This is a finite source, so contamination should diminish as the source is depleted. Contaminants, however, may be released for many years.

Thermal Desorption. Thermal desorption is an established method for removing volatile organics from soils. Mobile units currently exist with the capability of removing petroleum hydrocarbons, solvents, and chlorinated hydrocarbons. One unit successfully reduced tetrachloroethene concentrations in soil from 1,200 ppm to less than 0.025 ppm (Anderson 1993). It may be difficult to thermally desorb debris-laden soil because most mobile units use a screw-auger type conveyor.

Offsite Incineration. This is an established method for destroying contamination. Incineration is Best Demonstrated Available Technology (BDAT) for treatment of F-listed wastes required under the land disposal restrictions (40 CFR 268). Contaminant reduction by this alternative exceeds 99 percent. There are a number of RCRA permitted incinerators operating in the lower 48 states.

B. Project Costs

Table 4-10 is a summary of project costs for remedial alternatives evaluated for contaminated soil, drums, and debris at the Deactivated Landfill (LF01). Detailed cost estimates for each remedial alternative are in Attachment A.

C. Contaminant Reduction

The degree to which COCs will meet target cleanup levels (proposed remediation goals) for each alternative is summarized in Table 4-11. This measure is presented as post remedial concentration, and is a function of the initial concentration and the projected efficiency.

D. Project Duration

A breakdown of the project durations for the remedial alternatives being considered for soil, drums, and debris at the Deactivated Landfill (LF01) is shown in Table 4-12. Detailed project duration tables for each of the remedial alternatives evaluated for the source area at the Deactivated Landfill (LF01) are located in Attachment B.

E. Data Gaps

No Action. There are no data gaps.

Thermal Desorption. The data gap is the lack of knowledge on the type and degree of contamination in the source area (i.e., number and contents of buried drums), especially with regard to the COCs detected in downstream surface water.

Offsite Incineration. The data gap listed for thermal desorption also applies to this alternative.

4.4.2.2 Soil Beneath Buildings and Associated Gravel. Alternatives considered for treatment of the disturbed soils beneath buildings and associated gravel at Point Lay are:

- No action;
- Institutional controls and monitoring;
- Containment;
- Enhanced bioremediation; and
- Biosurfactants.

A. Successful Applications of Alternatives

No Action. As part of a study on bioremediation of DRPH-contaminated gravel pads and soils near Prudhoe Bay, a control cell was left unassisted and untreated. This control cell was, in essence, natural attenuation. Initial DRPH concentration was approximately 1,900 mg/kg. After nine weeks the DRPH concentration had decreased to 1,200 mg/kg. This indicates a reduction of 37 percent in DRPH concentration in 63 days. In addition, a slight increase in the microbial population was noted (Liddell et al. 1991).

TABLE 4-10. SUMMARY OF PROJECT COSTS FOR REMEDIAL ALTERNATIVE EVALUATED FOR THE SOIL, DRUMS, AND DEBRIS AT THE DEACTIVATED LANDFILL (LF01)

REMEDIAL ALTERNATIVE	TECHNOLOGY TESTING	CAPITAL COST	TOTAL LABOR	OPERATING COST	ENVIRONMENTAL TESTING	CLOSURE COST	ADMINISTRATIVE AND OTHER INDIRECT COSTS	PRESENT VALUE
No action	$0	$0	$0	$0	$0	$5,000	$750	$5,750
Thermal desorption	$7,500	$29,190	$753,285	$1,587,590	$1,400	$5,000	$953,585	$3,337,545
Offsite Incineration	$0	$11,350	$148,320	$2,404,100	$0	$5,000	$1,028,065	$3,598,235

TABLE 4-11. ESTIMATED CONTAMINANT REDUCTION FOR REMEDIAL ALTERNATIVES EVALUATED FOR THE SOILS DRUMS, AND DEBRIS AT THE DEACTIVATED LANDFILL (LF01)

REMEDIAL ACTION	CONTAMINANTS	INITIAL CONCENTRATION	TARGET CLEANUP LEVELS	POST REMEDIAL CONCENTRATION
No action	DRPH	624 mg/kg*	500 mg/kg	312 mg/kg
Thermal desorption	DRPH	624 mg/kg	500 mg/kg	0
Offsite incineration	DRPH	624 mg/kg	500 mg/kg	0

* The principal reason for taking remedial action at The Deactivated Landfill is that it is assumed materials in the landfill are the source of COCs in surface water (listed in a footnote to Table 4-1) . Both thermal desorption and offsite incineration would reduce the COCs to target cleanup levels.

TABLE 4-12. ESTIMATED PROJECT DURATION FOR REMEDIAL ALTERNATIVES EVALUATED FOR THE SOIL, DRUMS, AND DEBRIS AT THE DEACTIVATED LANDFILL (LF01)

REMEDIAL ALTERNATIVE	DURATION OF ONSITE REMEDIAL ACTIVITY (Days)	TOTAL PROJECT DURATION (Days)
No action	0	30
Thermal desorption	321	501
Offsite Incineration	37	157

Institutional Controls and Monitoring. The bioremediation study noted above applies to this remedial alternative.

Containment. Although there are no examples of maintaining freezing conditions to contain contaminants on the North Slope, the method has been developed as an innovative technology in the lower 48 states, and the low maintenance approaches of insulation and heat exchangers are routinely used in Alaska to protect the integrity of structures by keeping the level of permafrost at or near the ground surface.

Enhanced Bioremediation. Enhanced bioremediation has been successfully implemented in the arctic environment to treat petroleum hydrocarbon contamination on the North Slope. Studies at Point Thompson and Kuparuk oil fields in Alaska show that enhanced bioremediation is a successful and efficient method for reducing the concentration of petroleum hydrocarbons to a desired level within a relatively short time. The Point Thompson case study shows that 16,000

cubic yards of TPH-contaminated gravel with an initial concentration of 2,000 to 3,000 ppm was bioremediated to an average concentration of 285 ppm between July and September 1990 (Liddell et al. 1991).

The estimated remedial action efficiency of enhanced bioremediation is 94 percent based on case studies in Alaska and estimates of biodegradation kinetics.

Biosurfactants. Biosurfactants were used successfully in cleaning petroleum from rocks and underlying sands and soils in the Prince William Sound area in 1993 (PES 1993). They also were used successfully in cleaning hydrocarbon contamination from rocks and soils at a refinery in Kenai, Alaska in 1992 (Tesoro/PES 1992). Specific North Slope case studies have not been identified, but the site conditions, especially the shallow permafrost beneath the structures and existing drainage, should allow for easy collection of any materials introduced by this process. A wastewater discharge permit may be required.

The estimated remedial action efficiency for the biosurfactants is 90 percent, based on the reduction found in a case study done at the Tesoro Kenai Refinery (Tesoro/PES 1992) and consideration of the uncertainty in this application of the technology. This efficiency should be possible under conditions found on the North Slope; however, a treatability test will be conducted to determine site-specific efficiency.

B. Project Costs

A summary of project costs is included in Table 4-13. Detailed cost estimates for each remedial alternative are located in Attachment A.

C. Contaminant Reduction

The degree to which the concentrations of COCs will meet target cleanup levels (proposed remediation goals) for each alternative is summarized in Table 4-14.

D. Project Duration

A breakdown of the project durations for the remedial alternatives being considered for the soils beneath buildings at the Point Lay installation is shown in Table 4-15. Project durations are based on the assumption that, in the case of enhanced bioremediation, COC reduction to target levels will occur within three years of the start of the project or show through periodic monitoring a clear trend in that direction. This clear trend will justify site closure even if the target cleanup levels have not been met. The target cleanup levels for DRPH, RRPH, GRPH, and BTEX, again, are based on guidance and are negotiable with ADEC. Case studies cited support this approach.

A similar approach is taken for institutional controls and monitoring. In this case, it is assumed that natural, unassisted biodegradation of COCs will show a clear trend towards the target cleanup level based on periodic sampling that will justify site closure within three years.

TABLE 4-13. SUMMARY OF PROJECT COSTS FOR REMEDIAL ALTERNATIVE EVALUATED FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL

REMEDIAL ALTERNATIVE	TECHNOLOGY TESTING	CAPITAL COST	TOTAL LABOR	OPERATING COST	ENVIRONMENTAL TESTING	CLOSURE COST	ADMINISTRATIVE AND OTHER INDIRECT COSTS	PRESENT VALUE
No action	$0	$0	$0	$0	$0	$5,000	$750	$5,750
Institutional controls and monitoring	$0	$100	$29,320	$17,375	$2,330	$4,320	$14,850	$68,290
Containment	$0	$9,960	$61,340	$43,325	$2,330	$0	$30,560	$147,545
Biosurfactants	$7,500	$71,920	$64,910	$38,050	$1,680	$5,000	$47,265	$236,325
Enhanced bioremediation	$7,500	$4,420	$76,505	$43,325	$1,745	$4,320	$35,330	$173,140

TABLE 4-14. ESTIMATED CONTAMINANT REDUCTION FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL

SITE	REMEDIAL ACTION	CONTAMINANTS	INITIAL CONCENTRATION (mg/kg)	TARGET CLEANUP LEVELS (mg/kg)	POST REMEDIAL CONCENTRATION (mg/kg)
Garage (SS06) and Crushed Drum Area (SS08)	No action	DRPH	33,400	500	16,700
		GRPH	2,430	100	1,215
		RRPH	40,000	2,000	20,000
		BTEX	122	10	61
	Institutional controls and monitoring	DRPH	33,400	500	16,700
		GRPH	2,430	100	1,215
		RRPH	40,000	2,000	20,000
		BTEX	122	10	61
	Containment	DRPH	33,400/15,200[a]	500	33,400/7,600[b]
		GRPH	2,430/937[a]	100	2,430/469[b]
		RRPH	40,000/ND[a,d]	2,000	40,000/NA[b,c]
		BTEX	122/NA[c]	10	122/NA[b,c]
	Biosurfactants	DRPH	33,400	500	3,340
		GRPH	2,430	100	243
		RRPH	40,000	2,000	4,000
		BTEX	122	10	12
	Enhanced bioremediation	DRPH	33,400	500	2,004
		GRPH	2,430	100	146
		RRPH	40,000	2,000	2,400
		BTEX	122	10	7

a The first concentration relates to soils beneath buildings. Since containment involves no treatment, the post remedial concentration is the same as the initial concentration. The second concentration relates to the gravel and the remedial action efficiency of institutional controls and monitoring.
b The first concentration is a 0 percent reduction that corresponds to containment of soils beneath buildings. The second concentration is a 50 percent reduction that corresponds to gravel addressed by institutional controls and monitoring.
c Not applicable because the initial concentration is below target cleanup level, therefore, no remediation action is required.
d ND - Not detected.

TABLE 4-15. ESTIMATED PROJECT DURATION FOR REMEDIAL ALTERNATIVES EVALUATED FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL

REMEDIAL ALTERNATIVE	DURATION OF ONSITE REMEDIAL ACTIVITY (Days)	TOTAL PROJECT DURATION (Days)
No action	0	30
Institutional controls and monitoring	13	881
Containment	33	841
Biosurfactants	21	201
Enhanced bioremediation	30	988

Project duration for no action involves closure reporting only. Detailed project duration tables for each of the alternatives considered for this medium are located in Attachment B.

E. Data Gaps

No Action. There are no data gaps.

Institutional Controls and Monitoring. The data gap is the lack of information on the biodegradation potential.

Containment. The data gaps relate to design specifications including the most appropriate method for maintaining freezing conditions and the method for accessing the undersides of the structures at the Garage (SS06) and Crushed Drum Area (SS08).

Biosurfactants. There are no data gaps. The accessibility to soils beneath the buildings is a concern.

Enhanced Bioremediation. The data gap is the lack of information on the biodegradation potential. A treatability study will be necessary to determine the biodegradation potential of contaminants in this medium.

4.4.2.3 Tundra. Alternatives considered for treatment of tundra at Point Lay are:

- No action;
- Institutional controls and monitoring; and
- Enhanced bioremediation.

A. Successful Applications of Alternatives

No Action. See no action discussion in successful applications of alternatives for soil beneath buildings and associated gravel, Section 4.4.2.2 (page 4-43).

Institutional Controls and Monitoring. See no action discussion in successful applications of alternatives for soil beneath buildings and associated gravel, Section 4.4.2.2 (page 4-43).

Enhanced Bioremediation. See enhanced bioremediation for soil beneath buildings and associated gravel for discussion of successful applications, Section 4.4.2.2 (page 4-43).

B. Project Costs

A summary of project costs is included in Table 4-16. Detailed cost estimates for each remedial alternative are located in Attachment A.

C. Contaminant Reduction

The degree to which concentrations of COCs will meet target cleanup levels (proposed remediation goals) for each alternative is summarized in Table 4-17.

D. Project Duration

Estimated project durations are summarized in Table 4-18. The assumptions about project duration mirror those for soil beneath buildings. Detailed project duration estimates for each of the alternatives are located in Attachment B.

E. Data Gaps

No Action. There are no data gaps.

Institutional Controls and Monitoring. The data gap is the lack of information on biodegradation potential.

Enhanced Bioremediation. The lack of information on biodegradation potential and acceptable disturbance of tundra are the data gaps. A treatability study is necessary to determine the biodegradation potential of contaminants in tundra. Discussions with ADEC will clarify acceptable limits to disturbing the tundra.

4.4.3 Summary of Detailed Evaluation of Remedial Alternatives

Tables 4-19 through 4-21 summarize the remedial alternatives evaluated by site for soil, drums, and debris; soil beneath buildings and associated gravel; and tundra, respectively. Costs presented in the tables are based on the detailed cost sheets in Attachment A.

TABLE 4-16. SUMMARY OF PROJECT COSTS FOR REMEDIAL ALTERNATIVES EVALUATED FOR TUNDRA

REMEDIAL ALTERNATIVE	TECHNOLOGY TESTING	CAPITAL COST	TOTAL LABOR	OPERATING COST	ENVIRONMENTAL TESTING	CLOSURE COST	ADMINISTRATIVE AND OTHER INDIRECT COSTS	PRESENT VALUE
No action	$0	$0	$0	$0	$0	$5,000	$750	$5,750
Institutional controls and monitoring	$0	$100	$29,320	$17,325	$1,000	$4,320	$14,040	$66,145
Enhanced bioremediation	$7,500	$5,305	$76,505	$43,325	$1,165	$4,320	$35,390	$173,510

TABLE 4-17. ESTIMATED CONTAMINANT REDUCTION FOR TUNDRA

SITE	REMEDIAL ACTION	CONTAMINANTS	INITIAL CONCENTRATION (mg/kg)	TARGET CLEANUP LEVEL (mg/kg)	POST REMEDIAL CONCENTRATION (mg/kg)
Garage (SS06) and Crushed Drum Area (SS08)	No action	DRPH	7,300	500	3,650
		GRPH	420	100	210
		RRPH	7,000	2,000	3,500
		BTEX	37	10	19
	Institutional controls and monitoring	DRPH	7,300	500	3,650
		GRPH	420	100	210
		RRPH	7,000	2,000	3,500
		BTEX	37	10	19
	Enhanced bioremediation	DRPH	7,300	500	438
		GRPH	420	100	25
		RRPH	7,000	2,000	420
		BTEX	37	10	2

TABLE 4-18. ESTIMATED PROJECT DURATION FOR REMEDIAL ALTERNATIVES EVALUATED FOR TUNDRA

REMEDIAL ALTERNATIVE	DURATION OF ONSITE REMEDIAL ACTIVITY (Days)	TOTAL PROJECT DURATION (Days)
No action	0	30
Institutional controls and monitoring	13	881
Enhanced bioremediation	30	988

TABLE 4-19. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED FOR THE DEACTIVATED LANDFILL (LF01)

MEDIUM	REMEDIAL ACTION	CONTAMINANTS	REMEDIAL ACTION EFFICIENCY	INITIAL CONCENTRATION[a]	TARGET CLEANUP LEVEL	POST REMEDIAL CONCENTRATION (μg/L)	BENCH OR TREATABILITY STUDY REQUIRED	LEVEL OF WORKER PROTECTION	PROJECT COST	PROJECT DURATION (Months)
Sediment	No action	DRPH	50 percent	624 mg/kg[b]	500[c]	315	NO	D	5,750	1
	Thermal desorption	DRPH	100 percent	624 mg/kg[b]	500[c]	<1	YES	D	3,337,545	17
	Offsite incineration	DRPH	100 percent	624 mg/kg[b]	500[c]	<1	NO	D	3,598,235	6

a The initial concentration reflects contaminant concentration in sediment downstream of the LF01 site. Actual range of contamination at the source area has not yet been determined.

b It is assumed that the source includes potential COCs which have not yet been detected in the soil, drums, or debris but were detected in downstream surface water at maximum concentrations listed in a footnote to Table 4-1. The remedial action efficiencies apply to these potential COCs as well as DRPH and have no effect on other criteria in the table.

c Target cleanup level for DRPH in soil is based on ADEC Non-UST guidance and does not necessarily correspond to final site-specific cleanup goals.

TABLE 4-20. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED FOR SOILS BENEATH BUILDINGS AND ASSOCIATED GRAVEL

SITE	REMEDIAL ACTION	CONTAMINANTS	REMEDIAL ACTION EFFICIENCY	INITIAL CONCENTRATION (mg/kg)	TARGET CLEANUP LEVEL (mg/kg)	POST REMEDIAL CONCENTRATION (mg/kg)	BENCH OR TREATABILITY STUDY REQUIRED	LEVEL OF WORKER PROTECTION	PROJECT COST	PROJECT DURATION (Months)
Garage (SS06) and Crushed Drum Area (SS08)	No action	DRPH	50%	33,400	500	16,700	NO	D	$5,750	1
		GRPH	50%	2,430	100	1,215				
		RRPH	50%	40,000	2,000	20,000				
		BTEX	50%	122	10	61				
	Institutional controls and monitoring	DRPH	50%	33,400	500	16,700	NO	D	$68,290	29
		GRPH	50%	2,430	100	1,215				
		RRPH	50%	40,000	2,000	20,000				
		BTEX	50%	122	10	61				
	Containment	DRPH	90/50%[a]	33,400/15,200[b]	500	33,400/7,600	NO	D	147,545	29
		GRPH	90/50%[a]	2,430/937[b]	100	2,430/469				
		RRPH	90/50%[a]	40,000/ND[b,d]	2,000	40,000/NA[b,c]				
		BTEX	90/50%[a]	122/NA	10	122/NA[b,c]				
	Biosurfactants	DRPH	90%	33,400	500	3,340	YES	C	$236,325	7
		GRPH	90%	2,430	100	243				
		RRPH	90%	40,000	2,000	4,000				
		BTEX	90%	122	10	12				
	Enhanced bioremediation	DRPH	94%	33,400	500	2,004	YES	D	$173,140	33
		GRPH	94%	2,430	100	146				
		RRPH	94%	40,000	2,000	2,400				
		BTEX	94%	122	10	7				

a 90 percent refers to reduction in contaminant mobility in soils beneath buildings. Since containment does not reduce contaminant concentrations, the 90 percent is not factored into post remedial concentration. 50 percent refers to gravel addressed by institutional controls and monitoring.

b The first concentration relates to soils beneath buildings. Since containment involves no treatment, the post remedial concentration is the same in as initial concentration. The second concentration relates to the gravel and the 50 percent remedial action efficiency of institutional controls and monitoring.

c Not applicable because the initial concentration is below the target cleanup level, therefore no remedial action is required.

d ND - not detected.

TABLE 4-21. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED FOR TUNDRA

SITE	REMEDIAL ACTION	CONTAMINANTS	REMEDIAL ACTION EFFICIENCY	INITIAL CONCENTRATION (mg/kg)	TARGET CLEANUP LEVEL (mg/kg)	POST REMEDIAL CONCENTRATION (mg/kg)	BENCH OR TREATABILITY STUDY REQUIRED	LEVEL OF WORKER PROTECTION	PROJECT COST	PROJECT DURATION (Months)
Garage (SS06) and Crushed Drum Area (SS08)	No action	DRPH	50%	12,800	500	6,400	NO	D	$5,750	1
		GRPH	50%	550	100	275				
		RRPH	50%	12,000	2,000	6,000				
		BTEX	50%	60	10	30				
	Institutional controls and monitoring	DRPH	50%	12,800	500	6,400	NO	D	$66,145	29
		GRPH	50%	550	100	275				
		RRPH	50%	12,000	2,000	6,000				
		BTEX	50%	60	10	30				
	Enhanced bioremediation	DRPH	94%	12,800	500	768	YES	D	$173,510	33
		GRPH	94%	550	100	33				
		RRPH	94%	12,000	2,000	720				
		BTEX	94%	60	10	4				

4.4.4 Summary of the Nine Criteria

This section consists of an evaluation of the proposed alternatives. The alternatives are arranged by medium with reference to specific sites where it is appropriate, and will be analyzed according to the following nine criteria required in the NCP:

- Overall protection of human health and the environment;
- Compliance with ARARs;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume through treatment;
- Short-term effectiveness;
- Implementability;
- Cost;
- State acceptance (not evaluated at this time); and
- Community acceptance (not evaluated at this time).

State acceptance and community acceptance will be based on comments on the RI/FS report that will detail the proposed remedial alternative for each site.

The evaluation of the nine criteria is presented in Tables 4-22 through 4-24 for soil, drums, and debris; soils beneath buildings and associated gravel; and tundra. The following definitions of the nine criteria, taken from the EPA RI/FS Guidance Document and the NCP, are used.

Overall Protection of Human Health and the Environment. This criterion addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance With ARARs. This criterion addresses whether or not a remedy will meet all of the ARARs of federal and state environmental statutes and/or provide grounds for invoking a waiver.

Long-Term Effectiveness and Permanence. This criterion refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Reduction of Toxicity, Mobility, or Volume Through Treatment. This criterion is the anticipated performance of the treatment technologies a remedy may employ (reflects the anticipated performance of treatment).

Short-Term Effectiveness. This criterion addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

Implementability. This criterion is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

TABLE 4-22. EVALUATION OF NINE CRITERIA FOR THE DEACTIVATED LANDFILL (LF01)

SITE: Deactivated Landfill (LF01)	No Action	Thermal Desorption	Offsite Incineration
1. Overall Protection of Human Health and the Environment	This alternative may not be completely protective of human health and the environment because it does not comply with all chemical-specific ARARs. Therefore, it may not provide sufficient long-term effectiveness and permanence.	This alternative is protective of human health and the environment because it complies with all ARARs, provides long-term effectiveness and permanence, and provides short-term effectiveness.	This alternative is protective of human health and the environment because it complies with all ARARs, provides long-term effectiveness and permanence, and provides short-term effectiveness.
2. Compliance with ARARs	The use of this technology will comply with action specific and location specific ARARs, but may not provide enough reduction to comply with chemical specific ARARs.	The use of this technology will comply with all chemical specific, action specific, and location specific ARARs.	The use of this technology will comply with all chemical specific, action specific, and location specific ARARs.
3. Long-Term Effectiveness and Permanence	This alternative may not provide long-term effectiveness because with no source removal, contamination of downstream tundra and the lagoon will continue.	This alternative provides sufficient long-term effectiveness because the residual COC concentrations are below relevant risk and hazard levels and are below relevant action levels. It provides permanence because COCs are removed from the contaminated medium.	This alternative provides sufficient long-term effectiveness because the residual COC concentrations are below relevant risk and hazard levels, and are below relevant action levels. It provides permanence because COCs are removed from the contaminated medium.
4. Reduction of Toxicity, Mobility, and Volume Through Treatment	Results in a reduction in volume of DRPH through natural biodegradation.	Results in a reduction in volume of DRPH and COCs through treatment.	Results in a reduction in volume of DRPH and COCs through treatment.
5. Short-Term Effectiveness	This alternative will not detrimentally affect on environment, the surrounding community, or workers.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level D.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level D.
6. Implementability	This alternative is probably not administratively implementable though it is technically implementable based on the COCs detected in downstream surface water.	Technical implementability will be determined by performing a treatability study. Administrative implementability issues includes securing permits and siting the thermal desorption unit, which may be done in the hangar. Vendors are readily available.	This technology is technically implementable. Administrative implementability issues include securing permits, and siting of staging area, which should be possible at the hangar area. Vendors are readily available.
7. Cost	$5,750	$3,337,543	$3,598,236
8. State/Support Agency	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial alternatives.

TABLE 4-22. EVALUATION OF NINE CRITERIA FOR SOURCE AREA AT LF01 (CONTINUED)

SITE: Deactivated Landfill (LF01)	No Action	Thermal Desorption	Offsite Incineration
9. Community Acceptance	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.

TABLE 4-23. EVALUATION OF NINE CRITERIA FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL AT THE GARAGE (SS06) AND CRUSHED DRUM AREA (SS08)

Criterion	No Action	Institutional Controls and Monitoring	Biosurfactants	Enhanced Bioremediation	Containment
1. Overall Protection of Human Health and the Environment	This alternative is probably completely protective of human health and the environment. It does not comply with all chemical specific ARARs at the points of maximum COC concentration but does when concentrations are averaged over the site. Therefore, it probably provides sufficient long-term effectiveness and permanence.	This alternative is probably completely protective of human health and the environment. It does not comply with all chemical specific ARARs at the points of maximum COC concentration but does when concentrations are averaged over the site. Therefore, it probably provides sufficient long-term effectiveness and permanence.	This alternative is probably completely protective of human health and the environment. It does not comply with all chemical specific ARARs at the points of maximum COC concentration but does when concentrations are averaged over the site. Therefore, it probably provides sufficient long-term effectiveness and permanence.	This alternative is probably completely protective of human health and the environment. It does not comply with all chemical specific ARARs at the points of maximum COC concentration but does when concentrations are averaged over the site. Therefore, it probably provides sufficient long-term effectiveness and permanence.	This alternative is protective of human health and the environment as a temporary measure as long as freezing conditions are maintained.
2. Compliance with ARARs	The use of this technology will comply with all action specific and location specific ARARs and probably provide enough reduction to comply with all chemical specific ARARs if average site concentrations are used.	The use of this technology will comply with all action specific and location specific ARARs and probably provide enough reduction to comply with all chemical specific ARARs if average site concentrations are used.	The use of this technology will comply with all action specific and location specific ARARs and probably provide enough reduction to comply with all chemical specific ARARs if average site concentrations are used.	The use of this technology will comply with all action specific and location specific ARARs and probably provide enough reduction to comply with all chemical specific ARARs if average site concentrations are used.	This alternative complies with action-specific and location-specific ARARs. It does not comply with chemical-specific ARARs.
3. Long-Term Effectiveness and Permanence	This alternative may not provide sufficient long-term effectiveness because some residual COC concentrations are above relevant action levels.	This alternative may not provide sufficient long-term effectiveness because some residual COC concentrations are above relevant action levels.	This alternative may not provide sufficient long-term effectiveness because some residual COC concentrations are above relevant action levels.	This alternative may not provide sufficient long-term effectiveness because some residual COC concentrations are above relevant action levels.	This alternative does not provide long term effectiveness or permanence. It is intended to be a temporary measure.
4. Reduction of Toxicity, Mobility, and Volume Through Treatment	Results in a reduction in toxicity through natural biodegradation.	Results in a reduction in toxicity through natural biodegradation.	Results in a reduction in volume through treatment.	Results in a reduction in toxicity through treatment.	Results in no reduction in toxicity through treatment.
5. Short-Term Effectiveness	This alternative will not detrimentally affect the environment, the surrounding community, or workers.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level D.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level C, since the biosurfactants may act as irritants.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level D.	This alternative will present no detrimental effect on the environment or surrounding area. Workers may be exposed to COCs and difficult working conditions beneath the Garage.

TABLE 4-23. EVALUATION OF NINE CRITERIA FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL AT THE GARAGE (SS06) AND CRUSHED DRUM AREA (SS08) (CONTINUED)

Criterion	No Action	Institutional Controls and Monitoring	Biosurfactants	Enhanced Bioremediation	Containment
6. Implementability	This alternative could be technically and administratively implementable, provided that a risk management decision is made that COC concentrations do not warrant monitoring.	This alternative is technically and administratively implementable.	Technical implementability will be determined by performing a treatability study. Administrative implementability issues include securing permits and difficulties with application under structures. Materials are readily available.	Technical implementability will be determined by performing a treatability study. Administrative implementability issues include securing permits and difficulties with application under structures. Materials are readily available.	This alternative should be technically and administratively implementable.
7. Cost	$5,750	$68,290	$236,325	$173,140	$147,545
8. State/Support Agency	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial alternatives.
9. Community Acceptance	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.	Community Relations Plan is being implemented and community concerns will be addressed in a responsiveness summary.

TABLE 4-24. EVALUATION OF NINE CRITERIA FOR TUNDRA AT THE GARAGE (SS06) AND CRUSHED DRUM AREA (SS08)

Criteria	No Action	Institutional Controls and Monitoring	Enhanced Bioremediation
1. Overall Protection of Human Health and the Environment	This alternative is probably completely protective of human health and the environment. It does not comply with all chemical specific ARARs at the points of maximum COC concentration but does when concentrations are averaged over the site. Therefore, it probably provides sufficient long-term effectiveness and permanence.	This alternative is probably completely protective of human health and the environment. It does not comply with all chemical specific ARARs at the points of maximum COC concentration but does when concentrations are averaged over the site. Therefore, it probably provides sufficient long-term effectiveness and permanence.	This alternative is protective of human health and the environment because it complies with all ARARs, provides long-term effectiveness and permanence, and provides short-term effectiveness.
2. Compliance with ARARs	The use of this technology will comply with all action specific and location specific ARARs and probably provide enough reduction to comply with all chemical specific ARARs if average site concentrations are used.	The use of this technology will comply with all action specific and location specific ARARs and probably provide enough reduction to comply with all chemical specific ARARs if average site concentrations are used.	The use of this technology will comply with all chemical specific, action specific, and location specific ARARs.
3. Long-Term Effectiveness and Permanence	This alternative may not provide sufficient long-term effectiveness because some residual COC concentrations are above relevant action levels.	This alternative may not provide sufficient long-term effectiveness because some residual COC concentrations are above relevant action levels.	This alternative provides sufficient long-term effectiveness because the residual COC concentrations are below relevant risk and hazard levels, and are below relevant action levels. It provides permanence because COCs are removed from the contaminated medium.
4. Reduction of Toxicity, Mobility, and Volume	Results in a reduction in toxicity through natural biodegradation.	Results in a reduction in toxicity through natural biodegradation.	Results in a reduction in toxicity through treatment.
5. Short-Term Effectiveness	This alternative will not detrimentally affect the environment, the surrounding community, or workers.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level D.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level D.
6. Implementability	This alternative should be technically and administratively implementable, provided that a risk management decision is made that COC concentrations do not warrant monitoring.	This alternative is administratively implementable.	Technical implementability will be determined by performing a treatability study. Administrative implementability issues include securing permits. Materials are readily available.
7. Cost	$5,750	$66,145	$173,510
8. State/Support Agency	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial alternatives.
9. Community Acceptance	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.

Cost. Cost includes estimated capital and operation and maintenance costs, and net present work costs.

State Acceptance. State acceptance addresses the technical or administrative issues and concerns the support agency may have regarding each alternative.

Community Acceptance. Community acceptance addresses the issues and concerns the public may have regarding each of the alternatives.

4.4.5 Preferred Alternatives

The preferred alternatives for the media at the four sites are presented in Table 4-25. The preferred alternative for the source area at the Deactivated Landfill (LF01) is to excavate the material and transport it offsite for incineration. This alternative is more flexible then thermal desorption because in general its effectiveness is independent of the medium, including soil, drums, liquids, and debris. Offsite incineration would also be less impacted in terms of project duration by an increase in volume, concentration, or variety of material characteristics. Thermal desorption is less effective than offsite incineration with drums and debris. Thermal desorption requires treatability testing for application to soils and gravels because excessive moisture or fine-grained materials can severely reduce its effectiveness. In general, offsite incineration requires a much shorter duration than thermal desorption (given the assumed treatment rate of four tons/day), and may have greater community acceptance because there are no air emissions or hazards that are associated with long-term onsite treatment. In addition, offsite incineration is comparable in cost to thermal desorption (assuming the cost of incineration does not increase).

TABLE 4-25. PREFERRED REMEDIAL ACTION ALTERNATIVES

SITE NAME	SITE ID NUMBER	MEDIUM	RECOMMENDED ALTERNATIVE
Deactivated Landfill	LF01	Soil, drums, and debris	Offsite incineration
Garage	SS06	Soil beneath buildings and associated gravel	Enhanced bioremediation
		Tundra	Enhanced bioremediation
Drainage Pathway from POL Tanks	SS07	Tundra	Monitoring
Crushed Drum Area	SS08	Soil beneath buildings	Enhanced bioremediation
		Tundra	Enhanced bioremediation

The preferred alternative for the soil beneath buildings and associated gravel at the Garage (SS06) and Crushed Drum Area (SS08) is enhanced bioremediation. This alternative reduces COC concentrations to lower levels than biosurfactants, institutional controls and monitoring, and no action. Although the target cleanup level is not met for the maximum concentration of COCs observed, it would be if the average concentration over the area of concern was used. The average concentration is how the site will ultimately be judged clean. Further, the target cleanup level used is from an ADEC guidance document and is, therefore, subject to negotiation. Also, in time biodegradation efficiency could approach 100 percent.

The low levels of tetrachlorethene detected in soil at the Garage (SS06) and described in Section 4.0.2 would not be biodegraded by this alternative but would probably be reduced through volatilization.

Other advantages of enhanced bioremediation of soils beneath the buildings at the Garage (SS06) and the Crushed Drum Area (SS08) include a lower cost than biosurfactants and an opportunity to coordinate the remediation of the associated gravel and the tundra at the Garage and Crushed Drum Area. Finally, community and state acceptance would likely be high for this alternative because it is environmentally benign in its impact on the surrounding areas. The next best alternatives are biosurfactants (assuming a treatability test confirms it would work) and containment.

The preferred alternative for remediating tundra at the Garage (SS06 and Crushed Drum Area (SS08) is enhanced bioremediation. This alternative offers the best short and long term effectiveness without disturbing the tundra. It is the most expensive alternative but is also the only active alternative evaluated. Another advantage of this alternative is the opportunity to reduce cost by coordinating the remediation of tundra with enhanced bioremediation of soils beneath buildings and associated gravel. State and community acceptance are apt to be high because the alternative is environmentally benign. A treatability test is required. The next best alternative is institutional controls and monitoring.

The preferred alternative for the Drainage Pathway from POL Tanks (SS07) is monitoring to determine if the need exists for remedial action. Current data are inconclusive. The cost estimate assumes two rounds of sampling over a three year period. The second round of sampling may not be necessary if the first round samples are clean. If only the first round of sampling is necessary, the cost would be reduced by half.

Estimated costs for performing the preferred alternatives are as follows:

•	Monitoring (presumptive remedy)	$ 47,800
•	Offsite incineration (excavated material at LF01)	$3,598,235
•	Enhanced bioremediation (beneath buildings and gravel)	$ 173,140
•	Enhanced bioremediation (tundra)	$ 173,510
	TOTAL	$3,992,685

These alternatives are considered as stand-alone projects, and costs are estimated as such. If a coordinated approach to remediation is used, savings may be realized in preparation of

planning documents, mobilization and demobilization, onsite labor, transportation of equipment, wastes, and samples. In addition, the volume of material that must be treated and disposed has been estimated based on RI sampling and analyses. The actual volume may be reduced by field screening during remediation or may increase if the area of buried wastes and contaminated soil at the Deactivated Landfill (LF01) is greater than estimated. It is recommended that electromagnetic surveying and additional sampling be performed to further characterize the contamination at the Deactivated Landfill (LF01) prior to undertaking any remedial actions.

4.5 SITING STUDY

The remedial alternative for soil, drums, and debris at the Deactivated Landfill, offsite treatment and disposal, will require substantial areas for storing excavated materials and staging the shipping containers. This may be done at the hangar near the Deactivated Landfill (LF01) site.

Enhanced bioremediation of the tundra, soils beneath buildings and associated gravel do not require significant staging areas.

THIS PAGE INTENTIONALLY LEFT BLANK

ATTACHMENT A
COST ESTIMATES

Alternative: Monitoring
Estimated Costs

Sites:	Medium:	Surface Water	
Drainage Pathway from POL Tanks	Total volume:	Not Determined	
(SS07)	Project duration:	28 Months	(831 days)
	Discount rate:	5% *	

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:					
Planning Documents (Work plan, SAP, QAPjP, H&S)	2	Report	$5,000.00	$10,000	
Misc. Equipment and Supplies	2	Lump Sum	$100.00	$200	
Total Capital Cost over the 28 Month Project				$10,200	$0
OPERATING COSTS:					
Sampling (initial)	4	Sample	$70.00	$280	
Sampling (annual)	2	Event	$280.00		$560
Labor	192	Hr	$70.00	$13,440	
Per Diem	24	Days	$175.00	$4,200	
Project Management	29	Hr	$70.00	$2,016	
Travel for Sampling	6	Trips	$1,200.00		$7,200
Closure (Month 28)	1	Report	$5,000.00		$5,000
Total Operating Cost over the 28 Month Project				$19,936	$12,760
Total Direct Cost over the 28 Month Project				$30,136	$12,760
Procurement costs (5%)				$1,507	$638
Overhead (10%)				$3,014	$1,276
Contingency (10%)				$3,014	$1,276
Total Administrative Cost over the 28 Month Project				$7,534	$3,190
NET PRESENT WORTH					**$47,800**

* Estimated discount rate for calculating present value of future costs

Alternative: No Action
Estimated Costs

Site:
Deactivated Landfill (LF01)

Medium: Drums/debris/soil
Total volume: 625 CY
Project duration: 1 Month (30 days)
Discount rate: 5% *

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:					
Total Capital Cost over the 1 Month Project				$0	$0
OPERATING COSTS:					
Closure	1	Event	$5,000.00	$5,000	
Total Operating Cost over the 1 Month Project				$5,000	$0
Total Direct Cost over the 1 Month Project				$5,000	$0
Procurement costs (0%)				$0	$0
Overhead (10%)				$500	$0
Contingency (5%)				$250	$0
Total Administrative Cost over the 1 Month Project				$750	$0
NET PRESENT WORTH					**$5,750**

* Estimated discount rate for calculating present value of future costs

Alternative: Thermal Desorption
Estimated Costs

<u>Site:</u>	Medium:	Drums/debris/soil	
Deactivated Landfill (LF01)	Total volume:	625 CY	
	Project duration:	17 Months	(501 days)
	Discount rate:	5% *	

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:					
Planning Documents (RD/RA) (Work plan, SAP, QAPjP, H&S)	2	Report	$5,000.00	$10,000	
Development of Specifications (Draft and Final)	2	Report	$5,000.00	$10,000	
Treatability Study	1	Study	$7,500.00	$7,500	
Drum Cost	345	Drum	$42.50	$14,663	
Personal H & S Expendibles	643	Day	$10.00	$6,425	
Misc. Equipment and Supplies	1	Lump Sum	$100.00	$100	
Backhoe	1	Month	$3,000.00	$3,000	
Staging Area (Liner & Berm)	1	Lump Sum	$5,000.00	$5,000	
Total Capital Cost over the 17 Month Project				$56,688	$0
OPERATING COSTS:					
Mobilize/Demobilize Unit	1	Event	$300,000.00	$300,000	
Transport Equipment	1	Event	$2,000.00	$2,000	
Thermal Desorption Equipment	10	Month	$60,750.00	$607,500	
Thermal Desorption Personnel	10	Month	$30,885.00	$308,850	
Thermal Desorption Supplies	10	Month	$24,150.00	$241,500	
Incineration of Condensate	345	Drum	$500.00	$172,500	
Transportation of Wastes	1	Event	$150,000.00	$150,000	
Waste Profiling	1	Event	$750.00	$750	
Documentation	1	Event	$200.00	$200	
Labor (Oversight and Sampling)	5,188	Hr	$70.00	$363,160	
Per Diem	647	Day	$175.00	$113,138	
Backhoe Operator	136	Hr	$50.00	$6,800	
Sampling and Analysis	20	Sample	$70.00	$1,400	
Project Management	778	Hr	$70.00	$54,474	
Closure	1	Report	$5,000.00	$5,000	
Total Operating Cost over the 17 Month Project				$2,327,272	$0
Total Direct Cost over the 17 Month Project				$2,383,959	$0
Procurement costs (5%)				$119,198	$0
Overhead (10%)				$238,396	$0
Contingency (25%)				$595,990	$0
Total Administrative Cost over the 17 Month Project				$953,584	$0
NET PRESENT WORTH					**$3,337,543**

* Estimated discount rate for calculating present value of future costs

Alternative: Offsite Incineration
Estimated Costs

Site:	Medium:	Drums/debris/soil	
Deactivated Landfill (LF01)	Total volume:	625 CY	
	Project duration:	6 Months	(157 days)
	Discount rate:	5% *	

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:					
Planning Documents (RD/RA) (Work plan, SAP, QAPjP, H&S)	2	Report	$5,000.00	$10,000	
Development of Specifications (Draft and Final)	2	Report	$5,000.00	$10,000	
Super Sacks	625	Sack	$40.00	$2,083	
Drum Cost	10	Drum	$42.50	$425	
Personal H & S Expendibles	74	Day	$10.00	$740	
Misc. Equipment and Supplies	1	Lump Sum	$100.00	$100	
Staging Area (Liner & Berm)	1	Lump Sum	$5,000.00	$5,000	
Backhoe	1	Month	$3,000.00	$3,000	
Total Capital Cost over the 6 Month Project				$31,348	$0
OPERATING COSTS:					
Mobilize/Demobilize	1	Event	$140,000.00	$140,000	
Transport Equipment	1	Event	$2,000.00	$2,000	
Incineration (Solids)	1,125	Ton	$1,700.00	$1,912,500	
Incineration (Liquids)	10	Drums	$500.00	$5,000	
Transport Wastes	1	Event	$400,000.00	$400,000	
Waste Profiling	1	Event	$750.00	$750	
Documentation	1	Event	$200.00	$200	
Labor (Oversight and Sampling)	640	Hr	$70.00	$44,800	
Backhoe Operator	136	Hr	$50.00	$6,800	
Per Diem	78	Day	$175.00	$13,650	
Sampling and Analysis	20	Sample	$70.00	$1,400	
Project Management	96	Hr	$70.00	$6,720	
Closure	1	Report	$5,000.00	$5,000	
Total Operating Cost over the 6 Month Project				$2,538,820	$0
Total Direct Cost over the 6 Month Project				$2,570,168	$0
Procurement costs (5%)				$128,508	$0
Overhead (10%)				$257,017	$0
Contingency (25%)				$642,542	$0
Total Administrative Cost over the 6 Month Project				$1,028,067	$0
NET PRESENT WORTH					**$3,598,236**

* Estimated discount rate for calculating present value of future costs

Alternative: No Action

Estimated Costs

<u>Sites:</u>	Medium:	Tundra	
Garage (SS06)	Total volume:	2,730 CY	
Crushed Drum Area (SS08)	Project duration:	1 Month	(30 days)
	Discount rate:	5% *	

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:					
Total Capital Cost over the 1 Year Project				$0	$0
OPERATING COSTS:					
Closure	1	Event	$5,000.00	$5,000	
Total Operating Cost over the 1 Month Project				$5,000	$0
Total Direct Cost over the 1 Month Project				$5,000	$0
Procurement costs (0%)				$0	$0
Overhead (10%)				$500	$0
Contingency (5%)				$250	$0
Total Administrative Cost over the 1 Month Project				$750	$0
NET PRESENT WORTH					**$5,750**

* Estimated discount rate for calculating present value of future costs

Alternative: Institutional Controls and Monitoring
Estimated Costs

Sites:	Medium:	Tundra	
Garage (SS06)	Total volume:	2,730 CY	
Crushed Drum Area (SS08)	Project duration:	29 Months	(881 days)
	Discount rate:	5% *	

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:					
Planning Documents	2	Report	$5,000.00	$10,000	
(Work plan, SAP, QAPjP, H&S)					
Misc. Equipment and Supplies	1	Lump Sum	$100.00	$100	
Total Capital Cost over the 29 Month Project				$10,100	$0
OPERATING COSTS:					
Implement Institutional Controls	1	Event	$10,000.00	$10,000	
Sampling	3	Event	$560.00		$1,680
Labor	240	Hr	$70.00	$16,800	
Per Diem	30	Days	$175.00	$5,250	
Project Management	36	Hr	$70.00	$2,520	
Travel for Sampling	4	Trips	$1,200.00		$4,800
Closure (Month 29)	1	Report	$5,000.00		$5,000
Total Operating Cost over the 29 Month Project				$34,570	$11,480
Total Direct Cost over the 29 Month Project				$44,670	$11,480
Procurement costs (5%)				$2,234	$574
Overhead (10%)				$4,467	$1,148
Contingency (10%)				$4,467	$1,148
Total Administrative Cost over the 29 Month Project				$11,168	$2,870
NET PRESENT WORTH					$66,143

* Estimated discount rate for calculating present value of future costs

Alternative: Enhanced Bioremediation
Estimated Costs

Sites:	Medium:	Tundra	
Garage (SS06)	Total volume:	2,730 CY	
Crushed Drum Area (SS08)	Project duration:	33 Months	(988 days)
	Discount rate:	5% *	

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:					
Planning Documents (RD/RA) (Work plan, SAP, QAPjP, H&S)	3	Report	$5,000.00	$15,000	
Develop Specifications (30%, 95%, 100%)	3	Report	$5,000.00	$15,000	
Permitting (Air & Water)	2	Event	$2,000.00	$4,000	
Treatability study	1	Study	$7,500.00	$7,500	
Compressor	1	Month	$2,000.00	$2,000	
Nutrients	1,092	Lb	$1.00	$1,092	
Empty sand bags	43	Bag	$0.47	$20	
Hose	1	Hose	$50.00	$50	
Booms	5	Boom	$24.53	$123	
Trash pump	1	Month	$420.00	$420	
Personal H & S Expendibles	60	Day	$10.00	$600	
Misc. Equipment and Supplies	1	Lump Sum	$1,000.00	$1,000	
Total Capital Cost over the 33 Month Project				$46,805	$0
OPERATING COSTS:					
Mobilize/Demobilize	1	Event	$30,000.00	$30,000	
Transport Nutrients					
Transport Equipment					
Labor	528	Hr	$70.00	$36,960	
Per diem	64	Day	$175.00	$11,200	
Sampling & Analysis (initial)	6	Sample	$70.00	$420	
Sampling & Analysis (annual)	2	Event	$420.00		$840
Travel for Sampling	4	Trips	$1,200.00		$4,800
Project Management	79	Hr	$70.00	$5,544	
Closure	1	Report	$5,000.00		$5,000
Total Operating Cost over the 33 Month Project				$84,124	$10,640
Total Direct Cost over the 33 Month Project				$130,929	$10,640
Procurement costs (5%)				$6,546	$532
Overhead (10%)				$13,093	$1,064
Contingency (10%)				$13,093	$1,064
Total Administrative Cost over the 33 Month Project				$32,732	$2,660
NET PRESENT WORTH					**$173,509**

* Estimated discount rate for calculating present value of future costs

Alternative: No Action

Estimated Costs

<u>Sites:</u>	Medium:	Soils beneath building and gravel
Garage (SS06)	Total volume:	355 CY
Crushed Drum Area (SS08)	Project duration:	1 Month (30 days)
	Discount rate:	5% *

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:					
Total Capital Cost over the 1 Month Project				$0	$0
OPERATING COSTS:					
Closure	1	Event	$5,000.00	$5,000	
Total Operating Cost over the 1 Month Project				$5,000	$0
Total Direct Cost over the 1 Month Project				$5,000	$0
Procurement costs (0%)				$0	$0
Overhead (10%)				$500	$0
Contingency (5%)				$250	$0
Total Administrative Cost over the 1 Year Project				$750	$0
NET PRESENT WORTH					**$5,750**

* Estimated discount rate for calculating present value of future costs

Alternative: Institutional Controls and Monitoring
Estimated Costs

Sites:	Medium:	Soils beneath building and gravel	
Garage (SS06)	Total volume:	355 CY	
Crushed Drum Area (SS08)	Project duration:	29 Months	(881 days)
	Discount rate:	5% *	

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:					
Planning Documents (Work plan, SAP, QAPjP, H&S)	2	Report	$5,000.00	$10,000	
Misc. Equipment and Supplies	1	Lump Sum	$100.00	$100	
Total Capital Cost over the 29 Month Project				$10,100	$0
OPERATING COSTS:					
Implement Institutional Controls	1	Event	$10,000.00	$10,000	
Sampling (initial)	12	Sample	$70.00	$840	
Sampling (annual)	2	Event	$840.00		$1,680
Labor	240	Hr	$70.00	$16,800	
Per Diem	30	Days	$175.00	$5,250	
Project Management	36	Hr	$70.00	$2,520	
Travel for Sampling	6	Trips	$1,200.00		$7,200
Closure (Month 29)	1	Report	$5,000.00		$5,000
Total Operating Cost over the 29 Month Project				$35,410	$13,880
Total Direct Cost over the 29 Month Project				$45,510	$13,880
Procurement costs (5%)				$2,276	$694
Overhead (10%)				$4,551	$1,388
Contingency (10%)				$4,551	$1,388
Total Administrative Cost over the 29 Month Project				$11,378	$3,470
NET PRESENT WORTH					**$68,289**

* Estimated discount rate for calculating present value of future costs

Alternative: Containment

Estimated Costs

Sites:	Medium:	Soils beneath building	
Garage (SS06)	Total volume:	310 CY	
Crushed Drum Area (SS08)	Project duration:	4 Months	(119 days)
	Discount rate:	5% *	

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:					
Planning Documents (RD/RA) (Work plan, SAP, QAPjP, H&S)	3	Report	$5,000.00	$15,000	
Insulation	930	Sq Ft	$2.00	$1,860	
Gravel Cover	31	Ton	$100.00	$3,100	
Miscellaneous Equipment (including Heat Exchangers)	1	Lump Sum	$5,000.00	$5,000	
Total Capital Cost over the 4 Month Project				$24,960	$0
OPERATING COSTS:					
Mobilize/Demobilize	1	Event	$30,000.00	$30,000	
Labor	512	Hr	$70.00	$35,840	
Per diem	62	Day	$175.00	$10,850	
Project Management	77	Hr	$70.00	$5,376	
Total Operating Cost over the 4 Month Project				$82,066	$0
Total Direct Cost over the 4 Month Project				$107,026	$0
Procurement costs (5%)				$5,351	$0
Overhead (10%)				$10,703	$0
Contingency (10%)				$10,703	$0
Total Administrative Cost over the 4 Month Project				$26,757	$0
NET PRESENT WORTH					**$133,783**

* Estimated discount rate for calculating present value of future costs

Alternative: Biosurfactants

Estimated Costs

Sites:	Medium:	Soils beneath building and gravel	
Garage (SS06)	Total volume:	355 CY	
Crushed Drum Area (SS08)	Project duration:	7 Months	(201 days)
	Discount rate:	5% *	

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:					
Planning Documents (RD/RA) (Work plan, SAP, QAPjP, H&S)	3	Report	$5,000.00	$15,000	
Develop Specifications (30%, 95%, 100%)	3	Report	$5,000.00	$15,000	
Permitting (Air & Water)	2	Event	$2,000.00	$4,000	
Treatability study	1	Study	$7,500.00	$7,500	
Air Knife Purchase (pair)	1	Pair	$6,000.00	$6,000	
Compressor	1	Month	$2,000.00	$2,000	
Biosurfactant	1,950	Gal	$22.70	$44,262	
Trash pump	1	Month	$420.00	$420	
Booms	528	Boom	$24.53	$12,952	
Hoses	1	Hose	$50.00	$50	
Empty Sand Bags	25	Bag	$0.47	$12	
Purchase Empty Drums	113	Drum	$42.50	$4,803	
Personal H & S Expendibles	42	Day	$10.00	$420	
Misc. Equipment and Supplies	1	Lump Sum	$1,000.00	$1,000	
Total Capital Cost over the 7 Month Project				$113,418	$0
OPERATING COSTS:					
Mobilize/Demobilize	1	Event	$30,000.00	$30,000	
Transport Biosurfactant					
Transport Equipment					
Labor	384	Hr	$70.00	$26,880	
Per diem	46	Day	$175.00	$8,050	
Sampling & Analysis (initial)	12	Sample	$70.00	$840	
Sampling & Analysis (final)	1	Event	$840.00	$840	
Project Management	58	Hr	$70.00	$4,032	
Closure	1	Report	$5,000.00	$5,000	
Total Operating Cost over the 7 Month Project				$75,642	$0
Total Direct Cost over the 7 Month Project				$189,060	$0
Procurement costs (5%)				$9,453	$0
Overhead (10%)				$18,906	$0
Contingency (10%)				$18,906	$0
Total Administrative Cost over the 7 Month Project				$47,265	$0
NET PRESENT WORTH					**$236,325**

* Estimated discount rate for calculating present value of future costs

Alternative: Enhanced Bioremediation
Estimated Costs

Sites:	Medium:	Soils beneath building and gravel	
Garage (SS06)	Total volume:	355 CY	
Crushed Drum Area (SS08)	Project duration:	33 Months	(988 days)
	Discount rate:	5% *	

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:					
Planning Documents (RD/RA) (Work plan, SAP, QAPjP, H&S)	3	Report	$5,000.00	$15,000	
Develop Specifications (30%, 95%, 100%)	3	Report	$5,000.00	$15,000	
Permitting (Air & Water)	2	Event	$2,000.00	$4,000	
Treatability study	1	Study	$7,500.00	$7,500	
Compressor	1	Month	$2,000.00	$2,000	
Nutrients	142	Lb	$1.00	$142	
Empty sand bags	25	Bag	$0.47	$12	
Hose	1	Hose	$50.00	$50	
Booms	8	Boom	$24.53	$196	
Trash pump	1	Month	$420.00	$420	
Personal H & S Expendibles	60	Day	$10.00	$600	
Misc. Equipment and Supplies	1	Lump Sum	$1,000.00	$1,000	
Total Capital Cost over the 33 Month Project				$45,920	$0
OPERATING COSTS:					
Mobilize/Demobilize	1	Event	$30,000.00	$30,000	
Transport Nutrients					
Transport Equipment					
Labor	528	Hr	$70.00	$36,960	
Per diem	64	Day	$175.00	$11,200	
Sampling & Analysis (initial)	9	Sample	$70.00	$630	
Sampling & Analysis (annual)	2	Event	$630.00		$1,260
Travel for Sampling	4	Trips	$1,200.00		$4,800
Project Management	79	Hr	$70.00	$5,544	
Closure	1	Report	$5,000.00		$5,000
Total Operating Cost over the 33 Month Project				$84,334	$11,060
Total Direct Cost over the 33 Month Project				$130,254	$11,060
Procurement costs (5%)				$6,513	$553
Overhead (10%)				$13,025	$1,106
Contingency (10%)				$13,025	$1,106
Total Administrative Cost over the 33 Month Project				$32,563	$2,765
NET PRESENT WORTH					$173,142

* Estimated discount rate for calculating present value of future costs

ATTACHMENT B
ESTIMATED DURATION

Alternative: Monitoring
Estimated Project Duration

Sites:
Drainage Pathway from POL Tanks (SS07)

Start Date: Day 1
Medium: Surface Water

Activity	Duration	Start Date	End Date
Development of Planning Documents	60 Days	Day 1	Day 60
Mobilization	2 Days	Day 61	Day 62
First Biannual Sampling	3 Days	Day 63	Day 65
Second Biannual Sampling	3 Days	Day 796	Day 798
Demobilization	2 Days	Day 799	Day 800
Development of Closure Report	30 Days	Day 801	Day 830
Closure	0 Days	Day 831	Day 831
PROJECT DURATION	831 Days		

Alternative: No Action
Estimated Project Duration

<u>Sites:</u> Start Date: Day 1
Deactivated Landfill (LF01) Medium: Drums/debris/soil

Activity	Duration	Start Date	End Date
Development of Closure Report	30 Days	Day 1	Day 30
Closure	0 Days	Day 30	Day 30
PROJECT DURATION	30 Days		

Alternative: Thermal Desorption
Estimated Project Duration

Site: Deactivated Landfill (LF01)

Start Date: Day 1
Medium: Drums/debris/soil

Activity	Duration	Start Date	End Date
Perform Treatability Study	60 Days	Day 1	Day 60
Development of Planning Documents	90 Days	Day 61	Day 150
Development of Specifications	60 Days	Day 61	Day 120
Mobilize	14 Days	Day 151	Day 164
Preliminary Sampling	1 Days	Day 165	Day 165
Remediation	298 Days	Day 166	Day 463
Final Sampling	1 Days	Day 464	Day 464
Demobilize	7 Days	Day 465	Day 471
Develop Closure Report	30 Days	Day 472	Day 501
Secure Closure	0 Days	Day 501	Day 501
PROJECT DURATION	501 Days		

Alternative: Offsite Incineration
Estimated Project Duration

Site:
Deactivated Landfill (LF01)

Start Date: Day 1
Medium: Drums/debris/soil

Activity	Duration	Start Date	End Date
Development of Planning Documents	90 Days	Day 1	Day 90
Development of Specifications	60 Days	Day 1	Day 60
Mobilize	7 Days	Day 91	Day 97
Preliminary Sampling	1 Days	Day 98	Day 98
Excavation, Containerization, and Staging for Transport	21 Days	Day 99	Day 119
Final Sampling	1 Days	Day 120	Day 120
Demobilize	7 Days	Day 121	Day 127
Develop Closure Report	30 Days	Day 128	Day 157
Secure Closure	0 Days	Day 157	Day 157
PROJECT DURATION	157 Days		

Alternative: No Action
Estimated Project Duration

Sites:
Garage (SS06)
Crushed Drum Area (SS08)

Start Date: Day 1
Medium: Tundra

Activity	Duration	Start Date	End Date
Development of Closure Report	30 Days	Day 1	Day 30
Closure	0 Days	Day 30	Day 30
PROJECT DURATION	30 Days		

Alternative: Institutional Controls and Monitoring
Estimated Project Duration

Sites:
Garage (SS06) — Start Date: Day 1
Crushed Drum Area (SS08) — Medium: Tundra

Activity	Duration	Start Date	End Date
Development of Planning Documents	60 Days	Day 1	Day 60
Implementation of Institutional Controls	60 Days	Day 61	Day 120
Mobilize	2 Days	Day 121	Day 122
Preliminary Sampling	3 Days	Day 123	Day 125
Demobilization	2 Days	Day 126	Day 127
End of First Year Sampling	3 Days	Day 487	Day 489
End of Second Year Sampling	3 Days	Day 849	Day 851
Develop Closure Report	30 Days	Day 852	Day 881
Secure Closure	0 Days	Day 881	Day 881
PROJECT DURATION	881 Days		

Alternative: Enhanced Bioremediation
Estimated Project Duration

Sites:
Garage (SS06) — Start Date: Day 1
Crushed Drum Area (SS08) — Media: Tundra

Activity	Duration	Start Date	End Date
Perform Treatability Study	60 Days	Day 1	Day 60
Development of Planning Documents	90 Days	Day 61	Day 150
Development of Specifications	60 Days	Day 61	Day 120
Permits	60 Days	Day 151	Day 210
Mobilization	7 Days	Day 211	Day 217
Preliminary Sampling	3 Days	Day 218	Day 220
Application of nutrients and water	7 Days	Day 221	Day 227
Demobilization	7 Days	Day 228	Day 234
End of First Year Sampling	3 Days	Day 594	Day 596
End of Second Year Sampling	3 Days	Day 956	Day 958
Development of Closure Report	30 Days	Day 959	Day 988
Closure	0 Days	Day 988	Day 988
PROJECT DURATION	988 Days		

Alternative: No Action
Estimated Project Duration

Sites:
Garage (SS06)
Crushed Drum Area (SS08)

Start Date: Day 1
Medium: Soils beneath building and gravel

Activity	Duration	Start Date	End Date
Development of Closure Report	30 Days	Day 1	Day 30
Closure	0 Days	Day 30	Day 30
PROJECT DURATION	30 Days		

Alternative: Institutional Controls and Monitoring
Estimated Project Duration

<u>Sites:</u>
Garage (SS06) — Start Date: Day 1
Crushed Drum Area (SS08) — Medium: Soils beneath building and gravel

Activity	Duration	Start Date	End Date
Development of Planning Documents	60 Days	Day 1	Day 60
Implementation of Institutional Controls	60 Days	Day 61	Day 120
Mobilization	2 Days	Day 121	Day 122
Preliminary Sampling	3 Days	Day 123	Day 125
Demobilization	2 Days	Day 126	Day 127
End of First Year Sampling	3 Days	Day 487	Day 489
End of Second Year Sampling	3 Days	Day 849	Day 851
Development of Closure Report	30 Days	Day 852	Day 881
Closure	0 Days	Day 881	Day 881
PROJECT DURATION	881 Days		

Alternative: Containment
Estimated Project Duration

<u>Sites:</u>
Garage (SS06)
Crushed Drum Area (SS08)

Start Date: Day 1
Media: Soils beneath building

Activity	Duration	Start Date	End Date
Development of Planning Documents	90 Days	Day 1	Day 90
Mobilization	7 Days	Day 91	Day 97
Installation of Containment	15 Days	Day 98	Day 112
Demobilization	7 Days	Day 113	Day 119
PROJECT DURATION	119 Days		

Alternative: Biosurfactants
Estimated Project Duration

Sites:
Garage (SS06) Start Date: Day 1
Crushed Drum Area (SS08) Media: Soils beneath building and gravel

Activity	Duration	Start Date	End Date
Development of Planning Documents	90 Days	Day 1	Day 90
Development of Specifications	60 Days	Day 1	Day 60
Permits	60 Days	Day 91	Day 150
Mobilization	7 Days	Day 151	Day 157
Preliminary Sampling	3 Days	Day 158	Day 160
Application of biosurfactant to soil and requisite nutrients to drums of collected water	7 Days	Day 161	Day 167
Final Sampling	1 Day	Day 168	Day 168
Demobilization	3 Days	Day 169	Day 171
Development of Closure Report	30 Days	Day 172	Day 201
Closure	0 Days	Day 201	Day 201
PROJECT DURATION	201 Days		

Alternative: Enhanced Bioremediation
Estimated Project Duration

Sites:
Garage (SS06)
Crushed Drum Area (SS08)

Start Date: Day 1
Media: Soils beneath building and gravel

Activity	Duration	Start Date	End Date
Perform Treatability Study	60 Days	Day 1	Day 60
Development of Planning Documents	90 Days	Day 61	Day 150
Development of Specifications	60 Days	Day 61	Day 120
Secure Permits	60 Days	Day 151	Day 210
Mobilization	7 Days	Day 211	Day 217
Preliminary Sampling	3 Days	Day 218	Day 220
Application of nutrients and water	7 Days	Day 221	Day 227
Demobilization	7 Days	Day 228	Day 234
End of First Year Sampling	3 Days	Day 594	Day 596
End of Second Year Sampling	3 Days	Day 956	Day 958
Development of Closure Report	30 Days	Day 959	Day 988
Closure	0 Days	Day 988	Day 988
PROJECT DURATION	988 Days		

APPENDIX A

REFERENCES AND LIST OF ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASUREMENT

REFERENCES

Alaska Biological Research. 1994. Spectacled and Steller's Eiders Surveys at 11CEOS Remote Sites in Alaska, 1994. Fairbanks, Alaska. 30 September 1994.

Alaska Consultants, Inc. 1983. Background for Planning, City of Barrow. Prepared for the North Slope Borough.

Alaska Department of Environmental Conservation. 1989. Water Quality Standards 18 AAC 70. Prepared for the Triennial Review required by the Federal Clean Water Act (December 1989).

Alaska Department of Environmental Conservation. 1991. Interim Guidance for Non-UST Contaminated Soil Cleanup Levels. Guidance Number 001, Revision 1. Alaska Department of Environmental Conservation, Juneau, Alaska. July 17, 1991.

Alaska Department of Fish and Game. 1978. Alaska's Wildlife and Habitat, Volume II.

Alaska Division of Geological and Geophysical Survey. 1984. Alaska Heritage Resource Survey Records.

Alaska Natural Heritage Program. 1993. List and Definitions of Federal and State "Listed" Species Status. Facsimile transmission, 5 November 1993.

American Cancer Society. 1993. Cancer Facts and Figures-'93. American Cancer Society, Atlanta, Georgia.

American Geological Institute. 1972. Glossary of Geology. Washington D.C.

Anderson, William C. 1993. Innovative Site Remediation Technology 6: Thermal Desorption. American Academy of Environmental Engineers, pp 5.3.

APHA, AWWA. 1989. Standard Methods for the Examination of Water and Wastewater. 17th Edition.

Atlas, R.M. 1985. Effects of Hydrocarbons on Microorganisms and Petroleum Biodegradation in Arctic Ecosystems. F.R. Engelhardt, Ed. Petroleum Effects in the Arctic Environment. Canada Oil and Gas Lands Administration, Ottawa, Ontario, Canada.

Bergman, R.D., R.L. Howard, K.F. Abraham, and M.W. Weller. 1977. Water Birds and Their Wetland Resources in Relation to Oil Development at Storkersen Point, Alaska. U.S. Fish and Wildlife Service Resource Publication 129. Washington D.C.

CH2M Hill. 1981. Installation Restoration Program Search, Alaska DEW Line Stations. Prepared for the U.S. Air Force.

REFERENCES (CONTINUED)

Dames and Moore. 1986. Installation Restoration Program, Phase II, Stage 1 - Confirmation/ Quantification. Prepared for USAFOEHL/TS.

Dames and Moore. 1987. Installation Restoration Program, Phase II, Stage 2 - Confirmation/ Quantification. Prepared for USAFOEHL/TS.

Delorme Mapping. 1992. Alaska Atlas and Gazetteer. First Edition. Second Printing.

Dingman, S.L., R.G. Barry, G. Weller, C. Benson, E.F. LeDrew, and C. Goodwin. 1980. Climate, Snow Cover, Microclimate, and Hydrology. In J. Brown et al. (Eds.), An Arctic Ecosystem: The Coastal Tundra at Barrow, Alaska. US/IBP Synthesis Series No. 12. Dowden, Hutchinson, and Ross. Stroudsburg, Pennsylvania.

Evans, D., R. Elder, and R. Hoffman. 1992. Bioremediation of Diesel Contamination Associated with Oil and Gas Operations. Gas, Oil, and Environmental Biotechnology IV.

Everett, K.R. and R.J. Parkinson. 1977. Soil and Landform Associations, Prudhoe Bay Area, Alaska. Arctic and Alpine Research, 9: pp. 1-19.

Feulner, A.J., J.M. Childers, and V.W. Norman. 1971. Water Resources of Alaska. U.S. Geological Survey Open-File Report 71-105.

Frankenberger, W.T., Jr., K.D. Emerson, and D.W. Turner. 1989. In-Situ Bioremediation of an Underground Diesel Fuel Spill: A Case History. Environmental Management, 13(3)325-332.

Grantz, A., P.W. Barnes, D.A. Dinter, M.B. Lynch, E. Reminitz, and E.W. Scott. 1980. Geologic Framework; Hydrocarbon Potential, Environmental Conditions, and Anticipated Technology for Exploration and Development of the Beaufort Shelf North of Alaska. U.S. Geological Survey Open-File Report 80-94.

Grantz, A., P.W. Barnes, D.A. Dinter, M.B. Lynch, E. Reminitz, and E.W. Scott. 1982. Geologic Framework; Hydrocarbon Potential and Environmental Conditions for Exploration and Development of Proposed Oil and Gas Lease Sale in the Beaufort and Northeast Chukchi Seas. U.S. Geological Survey Open-File Report 82-48.

Hall, E.S., Jr. 1982. Preliminary Archeological and Historical Resource Reconnaissance of the Coastal Plain Area of the Arctic National Wildlife Refuge, Alaska. U.S. Geological Survey.

Hart Crowser. 1987. Environmental Assessment for North Warning System. Alaska.

Hull, R.N. and G.W. Suter II. 1994. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment Associated Biota: 1994 Revision. ORNL Environmental Restoration Program. ES/ER/TM-95/R1.

REFERENCES (CONTINUED)

Hussey, K.M. and R.W. Michaelson. 1966. Tundra Relief Features Near Point Barrow, Alaska. Arctic. V. 19, pp. 162-184.

Jacobson, M.J. and C. Wentworth. 1982. Kaktovik Subsistence: Land Use Values Through Time in the Arctic National Wildlife Refuge Area. U.S. Fish and Wildlife Service, Northern Alaska Ecological Services, Fairbanks.

Johnston, G.H. and R.J.F. Brown. 1964. Effect of a Lake on Distribution of Permafrost in the Mackenzie River Delta. Arctic, V. 17, No. 3, pp. 162-175.

Jorgenson, M.T., L. Krizan, and M. Joyce. 1991. Bioremediation and Tundra Restoration After an Oil Spill in the Kuparuk Oil Field, Alaska, 1990. Conference Paper, Environ Canada Arctic & Marine Oil Spill program, 14th Technical Seminar, Vancouver, B.C.

Jorgenson, M.T., T. Carter, M. Royce, and S. Ronzio. 1992. Cleanup and Bioremediation of a Crude-Oil Spill at Prudhoe Bay, Alaska.

Koranda, J.J. and C.D. Evans. 1975. A Discussion of Sites Recommended as Potential Natural Landmarkers in the Arctic Lowland, Natural Region, Northern Alaska. Tundra Biome Center. University of Alaska, Fairbanks.

Liddell, B.V., D.R. Smallbeck, and P.C. Ramert. 1991. Arctic Bioremediation: A Case Study. Proceedings of the 1991 SPE Annual Technical Conference and Exhibition.

Livingstone, D.A. 1954. On the Orientation of Lake Basins. American Journal of Science. V. 252, pp. 547-554.

Manahan, S.E. 1991. Environmental Chemistry. Lewis Publishers, Inc., Chelsea, Minnesota. Pp. 45-47.

Miller, M.C., R.T. Prentki, and R.J. Barsdale. 1980. Chapter 3 - Physics. In J.E. Hobbie (Ed.), Limnology of Tundra Ponds, Barrow, Alaska. Dowden, Hutchinson, and Ross, Inc., Stroudsburg, Pennsylvania.

MITRE. 1990. General Guidance for Ecological Risk Assessment at Air Force Installations. Prepared by The MITRE Corporation, Brooks Air Force Base, Texas; Prepared for Human Systems Division IRP Program Office, Brooks Air Force Base, Texas (December 1990).

National Petroleum Reserve in Alaska Task Force. 1978. 105(c) Land Use Study, Volume 2: Values and Resources Analysis. U.S. Department of the Interior. Anchorage, Alaska.

National Petroleum Reserve in Alaska Task Force. 1979. 105(c) Final Study, Volume 1: Summaries of Studies. U.S. Department of the Interior. Anchorage, Alaska.

REFERENCES (CONTINUED)

North Slope Borough. 1980. Qiniqtuagaksrat Utuqqanaat Inuuniagninisiqun, The Traditional Land Use Inventory for the Mid-Beaufort Sea, Volume 1. Commission on History and Culture, Barrow, Alaska.

Opresko, D.M., B.E. Sample, and G.W. Suter II. 1994. Toxicological Benchmarks for Wildlife: 1994 Revision. ORNL Environmental Restoration Program. ES/ER/TM-86/R1.

Osterkamp, T.E. and M.W. Payne. 1981. Estimates of Permafrost Thickness from Well Logs in Northern Alaska. Cold Regions Science and Technology, Volume 5, pp. 13-27.

PES. 1993. Tesoro, Inc. Vendor Brochure.

Pewe, Troy L. 1975. Quaternary Geology of Alaska. U.S. Geological Survey Professional Paper 835.

Ratliff, M.D. 1993. Construction and Operation of a Biological Treatment Cell for the Treatment of Hydrocarbon-Contaminated Soil in Alaska. Society of Petroleum Engineers, Conference Paper SPE 25998; SPE/EPA, Exploration & Production Environmental Conference. San Antonio, Texas.

Robertson, Scott B. 1988. Hydrology of Arctic Wetlands. ASWM Technical Report, p. 262-269.

Schneider, W.S. and R. Bennett. 1979. Point Lay Synopsis - Native Livelihood and Dependence: A Study of Land Use Values Through Time. Prepared by North Slope Borough Contact Staff for NPR-A Work Group 1.

Selkregg, L.L. 1975. Alaska Regional Profiles. Volume II Arctic Region.

Song, Hong-Gyu, X. Wang, and R. Bartha. 1990. Bioremediation Potential of Terrestrial Fuel Spills. Applied and Environmental Microbiology, 56(3)652-656.

Suter, G.W. and J.B. Mabrey. 1994. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1994 Revision. Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Tesoro/PES. 1992. Tesoro, Inc. Vendor Brochure.

U.S. Air Force. 1991a. Handbook to Support the Installation Restoration Program (IRP) Statements of Work. Installation Restoration Program Division, Human Systems Program Office, Human Systems Division, Brooks Air Force Base, Texas (May 1991).

U.S. Air Force. 1991b. Real Estate Map. Point Lay LLR Site. Alaska. May 1991 (Updated 1992).

REFERENCES (CONTINUED)

U.S. Air Force. 1993a. Work Plan for DEW Line and Cape Lisburne Radar Stations. Delivery Order 22. Prepared for Air Force Center for Environmental Excellence, Brooke Air Force Base, Texas. Prepared by ICF Technology, Inc.

U.S. Air Force. 1993b. Sampling and Analysis Plan DEW Line and Cape Lisburne Radar Stations. Delivery Order 22. Prepared for Air Force Center for Environmental Excellence, Brooke Air Force Base, Texas. Prepared by ICF Technology, Inc.

U.S. Air Force. 1993c. Health and Safety Plan DEW Line and Cape Lisburne Radar Stations. Delivery Order 22. Prepared for Air Force Center for Environmental Excellence, Brooke Air Force Base, Texas. Prepared by ICF Technology, Inc.

U.S. Air Force. 1996. Risk Assessment, Point Lay Radar Installation, Alaska. Delivery Order 22. Prepared for Air Force Center for Environmental Excellence, Brooke Air Force Base, Texas. Prepared by ICF Technology, Inc. March.

U.S. Bureau of the Census. 1991. 1990 Number of Inhabitants. U.S. Department of Commerce Report, Washington D.C.

U.S. Department of the Interior, Geological Survey. 1985. Study and Interpretation of the Chemical Characteristics of Natural Water. USGS Water-Supply Paper 2254. Third Edition.

U.S. Environmental Protection Agency. 1983. Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. March 1983.

U.S. Environmental Protection Agency. 1986. Test Methods for Evaluating Solid Waste (Physical Chemical Methods). Third Edition, EPA SW-846, September 1986.

U.S. Environmental Protection Agency. 1989a. Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Part A. Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington D.C.

U.S. Environmental Protection Agency. 1989b. Laboratory Data Validation Guidelines for Evaluating Inorganic Analyses. EPA Hazardous Site Evaluation Division. October 1989.

U.S. Environmental Protection Agency. 1990. Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses. EPA Hazardous Site Evaluation Division. December 1990.

U.S. Environmental Protection Agency. 1991a. Region 10 Supplemental Risk Assessment Guidance for Superfund. Region 10, U.S. Environmental Protection Agency, Seattle, Washington (August 16, 1991).

REFERENCES (CONTINUED)

U.S. Environmental Protection Agency. 1991b. Role of the Baseline Risk Assessment in Superfund Remedy Selection decisions. Office of Solid Waste and Emergency Response. Washington D.C. 22 April 1991.

U.S. Environmental Protection Agency. 1991c. Human Health Evaluation Manual, Part B: Development of Risk-Based Preliminary Remediation Goals. Office of Solid Waste and Emergency Response. Washington D.C. December 13, 1991.

U.S. Environmental Protection Agency. 1991d. Update on OSWER Soil Lead Guidance (OSWER Directive 9355.4-02). Office of Solid Waste and Emergency Response, Washington D.C. 29 August 1991.

U.S. Environmental Protection Agency. 1992. Framework for Ecological Risk Assessment. U.S. Environmental Protection Agency, Washington D.C. (February 1992).

U.S. Environmental Protection Agency. 1994. Ecological Risk Assessment Guidance for Superfund. Process for Designing and Conducting Ecological Risk Assessments. USEPA Environmental Response Team, Edison, New Jersey. September 26, 1994. Review Draft.

U.S. Fish and Wildlife Service. 1982. Arctic National Wildlife Refuge Coastal Plain Resource Assessment - Initial Report, Baseline Study of Fish, Wildlife, and Their Habitats. U.S. Department of the Interior. Anchorage, Alaska.

U.S. Fish and Wildlife Service, Federal Subsistence Board. 1992. Subsistence Management for Federal Public Lands in Alaska, Final Environmental Impact Statement.

U.S. Geologic Survey. 1955b. Point Lay (D-2) Quadrangle, Alaska, 1:63,360 Series (Topographic).

Vanguard Enterprises, Inc. 1991. Vanguard Microbial Bioremediator. Buffalo, New York.

Wahrhaftig, Clyde. 1965. Physiographic Divisions of Alaska. U.S. Geological Survey Professional Paper 482.

Walker, D.A., K.R. Everett, P.J. Webber, and J. Brown. 1980. Geobotanical Atlas of the Prudhoe Bay Region, Alaska. U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, Report 80-14.

Washington State Department of Ecology. 1992. Total Petroleum Hydrocarbons Analytical Methods of Soil and Water, April 1992.

Williams, John R. 1970. Ground Water in the Permafrost Regions of Alaska. U.S. Geological Survey Professional Paper 696.

REFERENCES (CONTINUED)

Woodward-Clyde Consultants. 1988. Final Work Plan, Installation Restoration Program Remedial Investigation/Feasibility Study, Phase II, Stage 3, Barter Island AFS (BAR-M), Bullen Point AFS (POW-3), Point Lonely AFS (POW-1), Alaska.

Woodward-Clyde Consultants. 1989. Technical Support Document for Record of Decision. LIZ-2 DEW Line Site.

LIST OF ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASUREMENT

ADEC	Alaska Department of Environmental Conservation
AFCEE	Air Force Center for Environmental Excellence
Air Force	United States Air Force
ARAR	Applicable or Relevant and Appropriate Requirement
ATV	All-Terrain Vehicle
BDAT	Best Demonstrated Available Technology
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COC	Chemical of Concern
CT&E	Commercial Testing & Engineering Co.
DEQPPM	Defense Environmental Quality Program Policy Memorandum
DOD	Department of Defense
DRO	Diesel Range Organics
DRPH	Diesel Range Petroleum Hydrocarbons
EPA	U.S. Environmental Protection Agency
ERA	Ecological Risk Assessment
F&B	Friedman & Bruya, Inc.
FS	Feasibility Study
FWPCA	Federal Water Pollution Control Act
GC	Gas Chromatograph
GC/MS	Gas Chromatography/Mass Spectrometry
GRA	General Response Action
GRO	Gasoline Range Organic
GRPH	Gasoline Range Petroleum Hydrocarbons
HQ	Hazard Quotient
HVOC	Halogenated Volatile Organic Compound
ICP	Inductively Coupled Plasma
IDW	Investigation Derived Waste
IRP	Installation Restoration Program
LRR	Long Range Radar
MCL	Maximum Contaminant Level
MSL	Mean Sea Level
NCP	National Contingency Plan
NPL	National Priorities List
PCB	Polychlorinated Biphenyl
PCE	Tetrachlorethylene
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control

LIST OF ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASUREMENT (CONTINUED)

QAPjP	Quality Assurance Project Plan
QC	Quality Control
RAGS	Risk Assessment Guidance for Superfund
RBSL	Risk-Based Screening Level
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SOP	Standard Operating Procedure
SRR	Short Range Radar
SVOC	Semi-Volatile Organic Compound
TCE	Trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TOC	Total Organic Carbon
TRV	Toxicity Reference Value
TSS	Total Suspended Solids
UCL	Upper Confidence Limit
VOC	Volatile Organic Compound

MEASUREMENTS

µg/L	micrograms per liter
cy	cubic yards
gpm	gallons per minute
mg/kg	milligrams per kilogram
ppb	parts per billion
ppm	parts per million

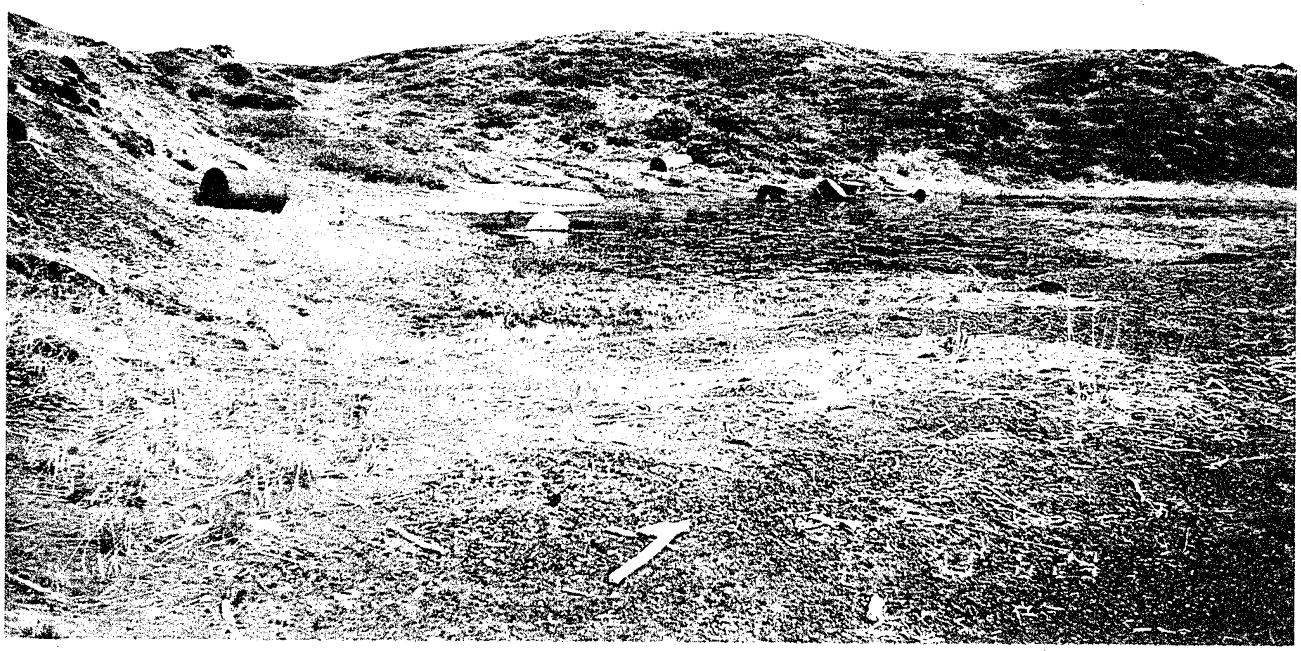
APPENDIX B

PHOTOGRAPHS OF POINT LAY RADAR INSTALLATION AND SITES

An aerial view to the south of the Point Lay radar installation in May.

This view shows the Point Lay radar installation and the community of Point Lay in the background, to the left. The community is located approximately three quarters of a mile to the north of the installation.

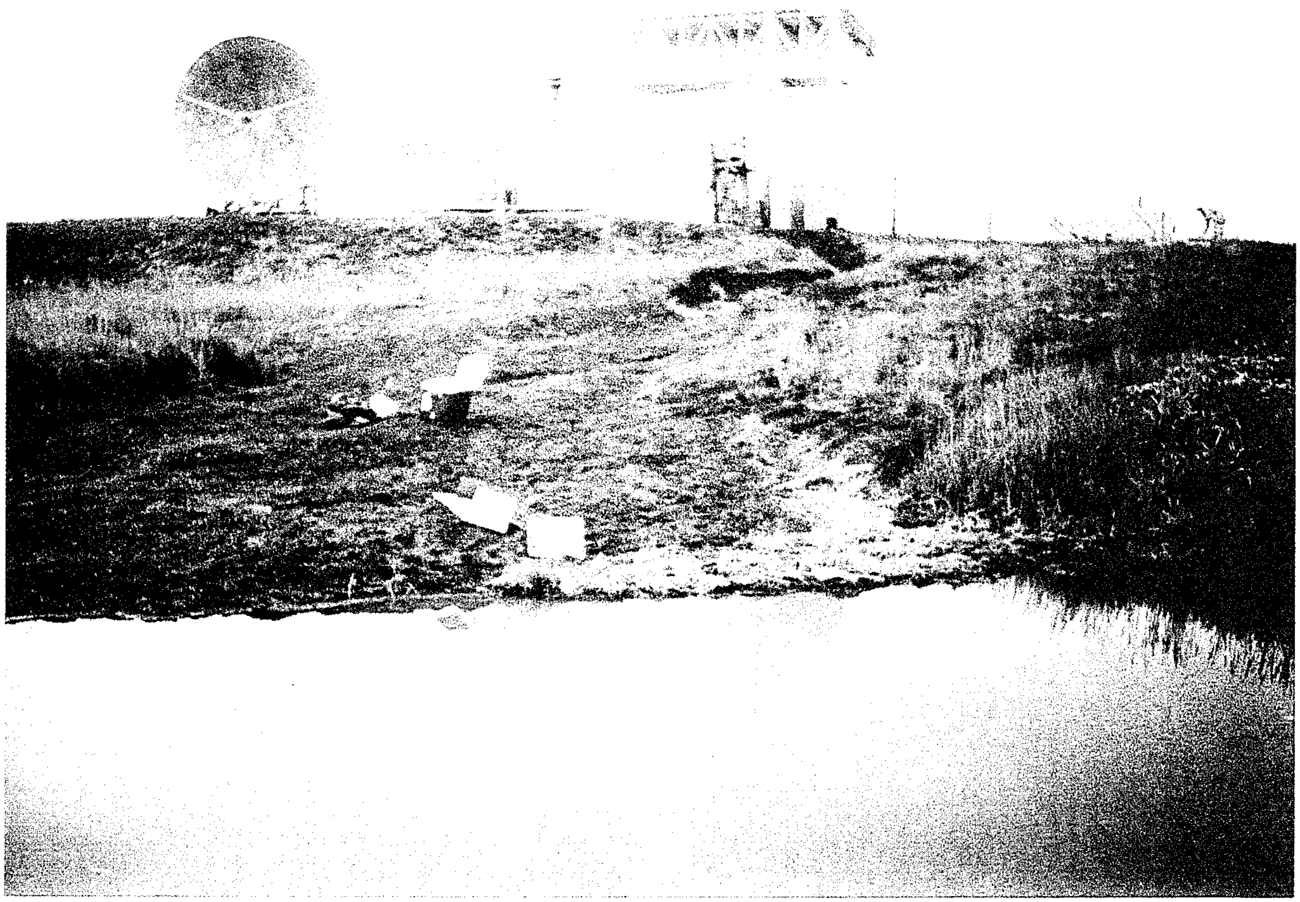
The Deactivated Landfill (LF01) site is located behind the hangar south of the main installation. This view is to the north.



A view to the east along the southern edge of the Deactivated Landfill (LF01) site.

This is a view to the southeast of the Garage (SS06) site at Point Lay.

The Drainage Pathway from POL Tanks (SS07) site consists of several channels, like the one shown here, that drain to the west.



This is a view to the southwest of the Crushed Drum Area (SS08) site. This area was investigated because of previous drum crushing activities at the site.

A view to the north of the Crushed Drum Area (SS08) site with the community of Point Lay in the background.

APPENDIX C

COPY OF THE TASK DESCRIPTIONS AND STATEMENT OF WORK

RFP 88X

88X

ORDER FOR SUPPLIES OR SERVICES

1. PAGE 1 OF 3

2. PROC INSTRUMENT ID NUMBER (PIIN): F33615-90-D-4010
MARK ALL PACKAGES AND PAPERS WITH THIS NUMBER

3. CALL/ORDER NUMBER: 0022

4. DATE OF ORDER*: 08 APR 1993

5. REQUISITION/PURCHASE REQUEST PROJECT NUMBER: FY7624-93-08202

6. CERTIFIED FOR NATIONAL DEFENSE UNDER BDC REG 2/DMS REG 1 RATING: DO-C9

7. ISSUED BY — CODE FQ2826
DEPARTMENT OF THE AIR FORCE
AIR FORCE MATERIEL COMMAND
HUMAN SYSTEMS CENTER/PK
8005 9TH STREET
BROOKS AFB TX 78235-5353
BUYER: EDWIN CUSTODIO/HSC-PKVBA
PHONE: (210) 536-4493

8. ADMINISTERED BY — CODE S2101A
DCASMA BALTIMORE
200 TOWSONTOWN BLVD, WEST
TOWSON MD 21204-5299

9. CONTRACTOR NAME AND ADDRESS — CODE 69148 — FACILITY CODE — F "S" FOR MULTIPLE FACILITIES SEE SECT "G"
ICF TECHNOLOGY, INC
9300 LEE HIGHWAY
FAIRFAX VA 22031-1207

PHONE: (703) 934-3000
COUNTY: FAIRFAX

10. MAIL INVOICES TO: U

11. DISCOUNT FOR PROMPT PAYMENT

1 ST	N %	DAYS	NET DAYS	
2 ND	%	DAYS	OTHER	
3 RD	%	DAYS	F "G" SEE SECT "G"	

12A. PURCHASE OFFICE POINT OF CONTACT: MVH/M6V/MVY

12B. RESERVED FOR SERVICE/AGENCY USE

13. PAYMENT WILL BE MADE BY — CODE S3910A F "G" SEE SECT "G"
DCASR, PHILADELPHIA
P.O. BOX 7730
PHILADELPHIA, PA 19101-7478

14. TYPE CONTRACTOR: A

15. SECURITY A. CLASSIFICATION: U — B. DATE OF DD 254

16. CONTRACT ADMINISTRATION

A. FAST PAY	B. CONTRACT (1) KIND (2) TYPE	C. ABSTRACT RSCP ADP POINT	D. SPL CONT PROVISIONS	E. CONT ADMIN FUNC LMT
	I Y			

17. (RESERVED) 18. SVC/AGENCY USE 19. SURV. CRIT: C 20. TOTAL AMOUNT: NOT-TO-EXCEED $299,855.00

21. APPROPRIATION AND ACCOUNTING DATA
A. ACTY CLAS: U B. ACRN: AA C. APPROPRIATION: 5733400 D. LIMIT SUBHEAD
E. SUPPLEMENTAL ACCOUNTING CLASSIFICATION: 303 7434 434419 00007 53440 78008F 674400
F. CPN RECIPIENT DODAAD: F74400 G. OBLIGATION AMOUNT: $299,855.00
H. NON-CLASSIFIED PAYMENT/FDC I. SVC ACBOOT USE: FY7624-93-08202

22A. TYPE OF ORDER: DELIVERY X / PURCHASE
B. NON-DOD CONTRACT NUMBER
This delivery order is subject to instructions contained on this side of form only and is issued in accordance with and subject to terms and conditions of above numbered contract, or Non-DOD Contract Number.
Reference your
Furnish the following on terms specified herein.

If quantity accepted by the Government is same as quantity ordered, indicate by check. If different, enter actual quantity accepted below quantity ordered and encircle.

23. UNITED STATES OF AMERICA
GARY J. MACDECY Gary J. Macdecy 93APR08
BY: NAME OF CONTRACTING/ORDERING OFFICER AND DATE

24. TOTAL
25. DIFFERENCES
29. INITIALS

26. QUANTITY ORDERED HAS BEEN
☐ INSPECTED ☐ RECEIVED ☐ ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS STATED

DATE — SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE

28. SHIP NUMBER ☐ PARTIAL ☐ FINAL
27. D.O. VOUCHER NUMBER
31. PAID BY
32. AMOUNT VERIFIED CORRECT FOR
30. PAYMENT ☐ COMPLETE ☐ PARTIAL ☐ FINAL
33. CHECK NUMBER
34. BILL OF LADING NUMBER

35. I CERTIFY THIS AMOUNT IS CORRECT AND PROPER FOR PAYMENT
SIGNATURE AND TITLE OF CERTIFYING OFFICER

36. RECEIVED AT 37. RECEIVED BY 38. DATE RECEIVED 39. TOTAL CONTAINERS 40. S/R ACCOUNT NUMBER 41. S/R VOUCHER NUMBER

AFSC Form 700, DEC 89 — PREVIOUS EDITION IS OBSOLETE

*When used as a formal contract this will be the effective date.

REFERENCE AF FORM 616 H93SR232 (Change #1), DATED: 23 MAR 93.

1. In accordance with the provisions of the Basic Contract F33615-90-D-4010 and this Delivery Order 0022, the contractor shall accomplish the effort described in the Statement of Work (SOW) dated 16 MAR 93 attached hereto at a total ceiling price of $299,855.00.

2. As a result of paragraph 1 above, the subject order is more specifically modified as set forth below:

SECTION B - THE SCHEDULE:

Item No	Supplies/Services	Quantity Purch Unit	Unit Price Total Item Amt
0001	CLIN sec class: U	1	N
	noun: SAMPLING, ANALYSIS AND DATA	LO	N

acrn: AA nsn: N
site codes pqa: D acp: D fob: D
pr/mipr data: FY7624-93-08202
type contract: Y

descriptive data:
Conduct work in accordance with the Statement of Work (SOW) of this order, dated 16 MAR 93 and Section C, The Description/Specifications of the Basic contract. Submit data in accordance with Attachment #1, the Contract Data Requirements List (CDRL) of the basic contract as implemented by paragraph VI of this order's SOW dated 16 MAR 93.

Item No	Supplies/Services	Quantity Purch Unit	Unit Price Total Item Amt
0002	CLIN sec class: U	1	N
	noun: SUPPORT		LO N

acrn: AA nsn: N
site codes pqa: D acp: D fob: D
pr/mipr data: FY7624-93-08202
type contract: Y

descriptive data:
Provide support in accordance with the Statement of Work (SOW) of this order, dated 16 MAR 93 and Section C, The Description/Specification of the basic contract.

3. SECTION C - Description/Specification: - See attached Statement of Work entitled "Installation Restoration Program/Remedial Investigation/Feasibility Study for Distant Early Warning (DEW) line Sites, AK (Barter Island AFS (BAR-M), Bullen Point AFS (POW-3), Point Lonely AFS (POW-1), Point Barrow AFS (POW-M), Point Lay AFS (LIZ-2), Wainwright AFS (LIZ-3), and Oliktok Point AFS (POW-2)" dated 16 MAR 93.

4. SECTION F - Schedule Data:

Item No	Supplies Schedule Data	Delivery Quantity	Schedule Date
0001	CLIN Del Sch sec class: U acrn: AA ship to: U descriptive data: Technical effort shall be completed in accordance with the Statement of Work (SOW) dated 16 MAR 93. All data shall be delivered in accordance with Attachment #1 of the basic contract as implemented by paragraph VI of the Statement of Work dated 16 MAR 93. The data shall be accepted by the Government not later than 31 DEC 93.	1	93DEC31
0002	CLIN Del Sch sec class: U acrn: AA ship to: U descriptive data: Technical effort shall be completed in accordance with the Contract Data Requirements List (Attachment #1) of the basic contract as implemented by paragraph VI of the Statement of Work.	1	93DEC31

1993 March 16

STATEMENT OF WORK
INSTALLATION RESTORATION PROGRAM
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

STAGE 1

DISTANT EARLY WARNING (DEW) LINE SITES and CAPE LISBURNE AFS, AK

I. DESCRIPTION OF WORK

1.1 Scope

1.1.1 **Background.** The objective of the Air Force Installation Restoration Program (IRP) is to assess past hazardous waste disposal and spill sites on Air Force installations and develop remedial actions consistent with the National Contingency Plan (NCP) for those sites which pose a threat to human health and welfare or the environment. This objective is achieved through a Remedial Investigation Feasibility Study (RI/FS) process in which conclusions and recommendations drawn from accurate and validated data are used to structure and guide subsequent activities.

The RI/FS process includes scoping to define data requirements and objectives, a remedial investigation to characterize sites for a baseline risk assessment, and a feasibility study to define and evaluate alternative remedial actions so that a recommended action may be selected. Each of these steps of the RI/FS process can be conducted in stages that focus on particular aspects of the process.

The contractor shall accomplish the actions described in this Statement of Work (SOW) to complete the RI/FS process at the following seven Dew Line Sites and Cape Lisburne:

Barter Island AFS (BAR-M); Bullen Point AFS (POW-3); Point Lonely AFS (POW-1); Point Barrow AFS (POW-M); Point Lay AFS (LIZ-2); Wainwright AFS (LIZ-3); and Oliktok Point AFS (POW-2).

1.1.2 **Requirements for Project Activities.** The Installation Restoration Program (IRP) Handbook referenced in this Statement of Work provides requirements for laboratory and field activities and applicable formats for project documents that shall be used by the contractor. Volume 1 of the Handbook dated May 1992 is provided under separate cover. This document is referenced in this Statement of Work as the Handbook. The contractor is responsible for the thorough knowledge and understanding of the previous findings and recommendations that affect this task prior to the start of field activities. The documents involved include but are not limited to the IRP Phase I Records Search, and the IRP Phase II plans and reports addressing the Dew Line Sites and Cape Lisburne.

1.1.3 **Meetings.** A maximum of two (2) contractor personnel, including the project leader, shall attend four (4) meetings at Elmendorf AFB, AK. Each meeting shall be two (2) 8-hour workdays in duration. All meetings shall be coordinated by the TPM .

1.1.4 **Special Notifications.** The contractor shall immediately report to the TPM, or designate, via telephone, any data or results generated during this investigation which may indicate an imminent health risk. Following this telephone notification, a written notice shall be prepared and

delivered within three (3) days. This notification shall include supporting documentation (sequence 16, para 6.1)

1.2 Project Scoping Documents

The purpose of the project scoping documents is to clearly and comprehensively define project activities prior to the initiation of field work. The contractor shall prepare and submit the following project scoping documents for this task prior to the initiation of any field activities or laboratory analyses.

1.2.1 **Engineering Network Analysis.** Provide within ten (10) days after the issuance of an order a computer generated network analysis which is a detailed task plan for the RI/FS work efforts. The network analysis (GANTT) chart shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period of the delivery order. The network analysis (GANTT) shall show both serial and parallel subtasks leading to a deliverable product or report, and shall show early and late start and completion dates with float. The network analysis (GANTT) shall be updated and submitted quarterly (sequence 3, para 6.1).

1.2.2 **Work Plan.** This section will discuss the overall approach, (including a brief summary of the Conceptual Site Model and Data Quality Objectives), major tasks, scope, timeline, and major decision points. Due to the extreme remoteness of the Dew Line Sites and Cape Lisburne, the contractor shall include a detailed plan for logistics and strategy to complete the RI/FS field activities. Follow the format specified in section 1 of the Handbook. In preparing the Work Plan, use previous reports and the information gathered during the literature search and presurvey along with experience at similar sites. Reevaluate the recommendations for Dew Line Sites and Cape Lisburne developed during previous IRP stages (sequence 4, para 6.1).

1.2.3 **Sampling and Analysis Plan (SAP).** The SAP consists of a quality assurance plan (QAPP) and a Field Sampling Plan (FSP). Prepare a SAP describing how project activities will be accomplished in the format specified in section 1 of the Handbook. Incorporate review comments and obtain TPM concurrence prior to the start of field activities (sequence 4, para 6.1).

1.2.4 **Health and Safety Plan (HSP).** Provide a written Health and Safety Plan within eight (8) weeks after the issuance of an order. The contractor shall comply with USAF, OSHA, EPA, state, and local health and safety regulations regarding the proposed work effort. Use EPA guidelines for designating the appropriate levels of protection needed at the study sites. The Health and Safety Plan shall provide no less protection than the protection contained in the manual entitled 'Health and Safety Requirements for Employees Engaged in Field Activities' dated 1981 and the 'Occupational Safety and Health Manual for Hazardous Waste Sites Activities' dated 1985 and 29 CFR 1910. Coordinate the Health and Safety Plan directly with applicable regulatory agencies prior to submittal to AFCEE/ESR. The contractor shall certify to AFCEE/ESR that the contractor has reviewed the coordinated Health and Safety Plan with each employee and also subcontractor's employees prior to the time each employee engages in field activities (sequence 4, para 6.1).

1.2.5 **Community Relations Plan.** The contractor shall prepare a Community Relations Plan (CRP) for the DEW Line Sites and Cape Lisburne AFS outlining the specific public communications and involvement techniques to be used in coordination with remedial site activities (sequence 4, para 6.1). Follow the guidance contained in 'Community Relations in Superfund, a Handbook', Office of Solid Waste and Emergency Response (OSWER) Directive

9230.0-03C (EPA/540/R-92/009, January 1992, PB92-963341), and other applicable directives. Also, use as a guidance previously accomplished CRP from other installations in Alaska. Appropriately adapt such guidance to the local situation at the DEW Line Sites and Cape Lisburne. As described in OSWER Directive 9230.0-03C, the CRP shall include, but not be limited to, a description of the sites and the community, an overview of the community involvement to date, key community concerns regarding the site and AF site activities, and suggested community relations activities. A contact list of elected officials, agency representatives, and interested groups and individuals shall be included in appropriate copies of the plan. In addition, the plan will include suggested locations for meetings and information repositories. Contractor activities to develop the CRP shall include conducting a review of site information provided by the AF.

1.3 Project Activities

The contractor shall conduct the following tasks to achieve the purposes stated herein, in compliance with approved scoping documents, the Handbook, and all applicable regulations and requirements.

1.3.1 Community Relations. Provide support to the base public affairs office for the tasks described below pertaining to the RI/FS Community Relations Program.

1.3.1.1 Public meetings and workshops. The contractor shall be responsible for coordinating public meetings and workshops for all DEW Line Sites and Cape Lisburne AFS. This includes producing briefing scripts, slides and any associated products such as response cards and sign-in sheets. As requested by the base Community Relations office in coordination with the TPM, research and provide materials for public queries, news media queries, and news releases. Assume a maximum of one (1) workshop/meeting (Seq. nos. 3,9).

1.3.1.2 Public notices. As required by the base Community Relations office and the TPM, the contractor shall prepare and publish public notices for the Fairbanks and local newspapers. The purpose of these notices is to inform the public of a meeting, workshop, or comment period in which they have the opportunity to be involved in the IRP Program at DEW Line Sites and Cape Lisburne AFS. Also, these notices may be utilized to inform the public of other pertinent program information such as quarterly notices of documents placed in the information repositories. The format for the notices shall be coordinated with the Community Relations office and TPM, and then submitted to the TPM for review prior to delivery to the base. Assume a maximum of two (2) notices (Seq. no. 3).

1.3.1.3 Photo Notebook The contractor shall develop a photo notebook which focuses on the overall IRP program at DEW Line Sites and Cape Lisburne AFS. The layout of the notebook will be coordinated with the public affairs office and TPM. Assume a maximum of one (1) update (Seq. no. 9).

1.3.1.4 Mailing List. In coordination with the base Community Relations office and the TPM, prepare and update the mailing list on a quarterly basis. Assume a maximum of two (2) updates (Seq. no. 3).

1.3.1.5 Maps. Prepare presentation quality maps of the installations and their sites to use in newsletters and to distribute to the public.

1.3.2 Literature Search. Conduct a literature search and analyze aerial photos of the DEW Line Sties to supplement existing information that has been collected. The purpose of the literature search is to complete the

conceptual site model so that a numerical estimate of risk can be developed.

1.3.3 **Presurvey.** Within eight weeks of the issuance of an order, the contractor shall visit the Dew Line Sites and Cape Lisburne to ensure complete understanding of site conditions. Coordinate this visit with the TPM and the 11 CEOS project manager. The contractor shall look for evidence of contamination at each site visited (e.g., leaking drums, vegetative stress, leachate seeps). The contractor shall observe the physical settings of each site visited to formulate specific recommendations concerning boring placement, use of geophysical techniques, and other aspects of the proposed field investigation. The findings of the presurvey shall be used to prepare the Work Plan, SAP, and HSP for the RI and to prepare scoping documents for the treatability study(ies). Assume one presurvey and one reconnaissance trips.

1.3.4 **Quality Assurance/Quality Control (QA/QC).** A QA/QC program shall be conducted and documented for all work pursuant to this delivery order. Contractor and project-specific documents concerning QA/QC procedures and requirements shall be strictly followed. Data generated under the QA/QC program shall be used by the contractor for evaluating the analytical results and field records assembled for each site to identify accurate and validated data that may be used to assess risk, develop conceptual site models and evaluate alternatives.

1.3.5 **Conceptual Site Model.** Use all available RI/FS data supported by acceptable QA/QC results (as measured against QAPP requirements) and site characterization information to refine, based on newly collected data, the conceptual site model. The model shall define the nature and extent of contamination and the transport and fate of those contaminants. The minimum requirements of the model are given in section 2 of the Handbook. The complexity and detail of the site model shall be consistent with the nature of the site and site problems, and the amount of data available the conceptual site model shall be documented in the Work Plan.

1.3.6 **ARARs Evaluation.** The contractor shall identify all Applicable or Relevant and Appropriate Requirements (ARAR). These ARARs will be documented in the Work Plan.

1.4 Project Deliverables

Deliver the following documents in compliance with the requirements of item VI, the formats required in section 1 and 4 of the Handbook, and the specifications noted below. Draft reports are considered 'drafts' only because they have not been reviewed and approved by the Air Force. In all other respects, 'drafts' shall be complete, in the proper format, fully illustrated, and free of grammatical and typographical errors.

1.4.1 Scoping Documents.

a. Engineering Network Analysis (GANTT) (para 1.2.1). Provide within ten (10) days after the issuance of an order. Update and submit quarterly (sequence 3, para 6.1).

b. Work Plan (para 1.2.2). Use the format in section 1 of the Handbook (sequence 4, para 6.1).

c. Sampling and Analysis Plan (1.2.3). Use the format in section 1 of the Handbook (sequence 4, para 6.1).

d. Health and Safety Plan (para 1.2.4). Provide within six (6) weeks after the issuance of an order (sequence 4, para 6.1).

e. Community Relations Plan (para 1.2.5). Provide within eight (8) weeks after issuance of an order (sequence 4, para 6.1).

1.4.2 **Special Notification.** Provide written notification of imminent health hazards and supporting documentation within three (3) days of telephone notification (sequence 15, para 6.1).

1.4.3 **Presentation Materials.** The contractor shall prepare and present up to two (2) presentation packages at meetings coordinated by the Air Force (sequence 9, para 6.1). Attendance of these meetings is included in paragraph 1.1.3 of this SOW. As part of the presentation materials, the contractor shall provide paper copies of all slides and overheads.

1.4.4 **Meeting summaries** (para 1.1.3). Provide no later than five (5) days after conclusion of each meeting (sequence 18, para 6.1).

1.4.5 **Newsletter.** Prepare and submit a quarterly newsletter which presents the status of the entire base IRP Program. This will include preparing an outline resulting from input by all contractors involved in the program. The outline must be approved by the base and TPM prior to submittal of the newsletter. The final product will be printed and distributed as agreed to by the TPM. Assume a maximum of two (2) newsletters (Sequence no. 3).

1.4.6 **Fact Sheets.** As required by the base IRP Program, prepare and submit fact sheets which facilitate the public's understanding of the IRP Program. These sheets should include key community concerns regarding sites as specified by the base. Use the format agreed to by the base and TPM. Print and distribute the fact sheets as agreed to by the TPM. Assume a maximum of two (2) fact sheets (Sequence no. 3).

1.4.7 **Public Notices.** In accordance with paragraph 1.3.6.2, prepare and submit public notices for the Fairbanks and local newspapers. Use the format agreed to by the base and TPM (Sequence no. 3).

1.4.8 **Photo Notebook.** In accordance with paragraph 1.3.6.3, develop a photo notebbok which focuses on the overall base IRP Program. Prior to implementation, submit a conceptual layout of the notebook for review by the base and TPM (Sequence no. 9).

1.4.9 **Mailing List.** In accordance with the base Community Relations coordinator and paragraph 1.3.6.4, update the existing mailing list on a quarterly basis (Sequence no. 3).

1.4.10 **Maps.** In accordance with the base community Relations coordinator and paragraph 1.3.6.5, prepare presentation quality maps.

II. **Site Location and Dates**

Dew Line Sites and Cape Lisburne, date to be established.

III. **Base Support** The base will:

3.1 Provide the contractor with existing engineering plans, drawings, diagrams, aerial photographs, digitized map files, etc., to facilitate evaluation of IRP sites under investigation.

DEWSCOPO.DOC

3.2 Arrange for personnel identification badges, vehicles passes, and/or entry permits with the contention the contractor will provide necessary information to the base personnel no less than four weeks before needed.

3.3 Provide the contractor with all previously approved documents which provide information on all IRP efforts conducted at Dew Line Sites and Cape Lisburne and will aid in the determination of the amount of field work and analyses which need to be conducted.

IV. Government Furnished Property

See above in section III.

V. Government Points of Contact:

5.1 MAJCOM Coordinator

Major James R. Williams III
AFCEE/ESRU
8001 Inner Circle DR STE 2
Brooks AFB TX 78235-5328
(210) 536-5243
DSN 240-5243
(210) 536-9026 FAX
DSN 240-9026

5.2 Restoration Team Chief

Mr. Marty M. Faile
AFCEE/ESRU
8001 Inner Circle DR STE 2
Brooks AFB TX 78235-5328
(210) 536-5243
DSN 240-5243
(210) 536-9026 FAX
DSN 240-9026

5.3 Base Point of Contact (POC)

Mr. Jim Wolfe
11 CEOS/DEVR
21885 Second Street
Elmendorf AFB AK 99506-4420
(907) 552-4532
DSN 317-552-4532
(907) 552-1533 FAX
DSN 317-552-1533

5.4 Public Affairs Coordinator

Ms. Wende Wolf
11 CEOS/DEVR
21885 Second Street
Elmendorf AFB AK 99506-4420
(907) 552-4532
DSN 317-552-4532
(907) 552-1533 FAX
DSN 317-552-1533

DEWSCOPO.DOC

VI. Deliverables

6.1 Attachment 1 of the Basic Contract

Sequence numbers 1 and 5 listed in attachment 1 to the basic contract app. all orders. Guidance for preparing R&D Status Reports (sequence 1) is contained in the Handbook, section 4. In addition, the sequence numbers an dates listed below are applicable to this order:

Sequence No.	PWS No.	Block 10 (Freq.)	Block 11 (as of date)	Block 12 (date of 1st submit.)	Block 13 (date of final report)	Block 14 (no. of copies)
3 (NETWORK ANALYSIS)	I.1.4.1a	QTRLY	12APR93	30APR93	a	4
4 (WORK PLAN)	I.1.4.1b	ONE/R	12APR93	30MAY93	30JUL93	b
4 (SAP)	I.1.1.4c	ONE/R	12APR93	30MAY93	30JUL93	b
4 (HSP)	I.1.4.1d	OTIME	12APR93	30MAY93	-	10
4 (COMM. REL. PLAN)	I.1.1.4e	ONE/R	12APR93	30MAY93	31DEC93	b
16 (SPECIAL NOTIF.)	I.1.6.2	OTIME	c	c	-	1
9 (PRESENT. MATERIAL)	I.1.4.3	ASREQ	d	d	-	10
10 (MTG. RPTS)	I.1.4.4	ONE/R	e	e	-	5
3 (NEWSLETTER)	I.1.4.5	QTRLY	12APR93	30NOV93	a	f
3 (FACT SHEETS)	I.1.6.6	ASREQ	12APR93	15JUL93	g	-
3 (PUBLIC NOTICES)	I.1.4.7	ASREQ	12APR93	15JUL93	g	[illegible]
9 (PHOTO NOTEBOOK)	I.1.4.8	OTIME	12APR93	15JUL93	-	-
3 (MAILING LIST)	I.1.6.9	QTRLY	12APR93	15JUL93	a	-
3 (MAPS)	I.1.4.10	OTIME	12APR93	15JUL93	-	2

6.2 Reserved.

6.3 Notes

a. Submit Quarterly Thereafter.

b. One (1) first draft plan (8 copies), one (1) second draft plan (8 copies), and one (1) final plan (10 copies) are required. Incorporate Air Force comments into the second draft and final plan as specified by the TPM. Supply AFCEE/ESR with an advance copy of the first draft, second draft, and final plan for acceptance prior to distribution. Distribute the remaining copies of each plan as specified by the TPM. The second and final reports shall be submitted within three (3) weeks of receipt of comments from the TPM.

c. Primary and Secondary Documents. One first draft report (25 copies), one second draft report (25 copies), and one final report (35 bound copies plus the original camera-ready copy and a 3.5 inch disk formatted in WordPerfect 5.1 containing the document file) are required. Incorporate Air Force comments into the second draft and final reports as specified by the TPM. Supply the TPM with an advance copy of the first draft, second draft, and final reports for acceptance prior to distribution. Distribute the remaining copies as specified by the TPM .

d. Provide written notice with supporting documentation within three (3) days of telephone notification and at the direction of the TPM. Assume a maximum of 100 pages.

e. Provide within one (1) week of task/meeting completion.

f. Provide 500 copies of the Newsletters and distribute as agreed to by the TPM. This includes mailing the final product to on-base personnel and addresses on the existing mailing list.

g. Provide draft and final deliverables. Provide two advance copies to the AFCEE TPM and to the 11 CEOS Community Relations Coordinator for acceptance prior to preparation of the final deliverables.

h. Provide poster-size map.

DSWSCOPO.DOC

REF 68X 68X

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. PAGE 1 OF 3

2. DOC INSTRUMENT ID NO. (PIIN): F33615-90-D-4010
3. SPIIN: 002201
4. EFFECTIVE DATE:
5. REQUISITION/PURCHASE REQUEST PROJECT NO.: FY7624-93-08305
6. BCC/DMS RATING: --

7. ISSUED BY CODE FQ2826

DEPARTMENT OF THE AIR FORCE
AIR FORCE MATERIEL COMMAND
HUMAN SYSTEMS CENTER/PK
8005 9TH STREET
BROOKS AFB TX 78235-5353
Buyer: EDWIN CUSTODIO/HSC-PKVBA
Phone: (210) 536-4493

8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) CODE S2404A

DCMAO, BALTIMORE
200 TOWNSONTOWN BLVD., WEST
TOWNSON MD 21204-5299

9. CONTRACTOR NAME AND ADDRESS CODE 69148 FACILITY CODE

IF "Y" FOR MULTIPLE FACILITIES SEE SECT "K"

ICF TECHNOLOGY
9330 LEE HIGHWAY
FAIRFAX VA 22031-1207
COUNTY; FAIRFAX
PHONE: (703) 934-3000

MAIL DATE
JUN 1? 1993

MAILING ADDRESS;
ICF TECHNOLOGY, INC
ATTN: CYNTHIA L. FALCE
FOUR GATEWAY CENTER 12TH FLOOR
PITTSBURGH PA 15222

10. SECURITY CLAS U

11. DISCOUNT FOR PROMPT PAYMENT

1 ST	.	DAYS	NET DAYS
2 ND	.	DAYS	OTHER IF "Y"
3 RD	.	DAYS	SEE SECT "E"

12. PURCHASE OFFICE POINT OF CONTACT
MVH/M6V/MVY

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in block 17. The hour and date specified for receipt of Offers ☐ is extended ☐ is not extended

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods:

(a) By signing and returning ______ copies of this amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

14. THIS BLOCK APPLIES ONLY TO MODIFICATION OF CONTRACTS

☐ THIS CHANGE IS ISSUED PURSUANT TO ______ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVED NUMBERED CONTRACT/ORDER.

☐ THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.

☐ THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF ______ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.

☒ THIS MODIFICATION IS ISSUED PURSUANT TO FAR 52.243-3, Changes - Time and Materials or Labor Hours (Aug 1987)

15. CONTRACT ADMINISTRATION DATA

A. KIND OF MOD	B. MOD ABST RECIPIENT ADP PT	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PO/CAO ON TRANSFER	F. GAINING PO/CAO ON TRANSFER	G. SVC/AGENCY USE
C			$			

16. ENTER ANY APPLICABLE CHANGES

A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1) TYPE (2) KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE	H. DATE SIGNED	I. SECURITY (1) CLAS (2) DATE OF DD 254
							-	

17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.) SUBJ: INCREASE IN CEILING AMOUNT

PROJECT OFFICER: MICHAEL F. MCGHEE, AFCEE/ESR, 8001 INNER CIRCLE, SUITE 2, BROOKS AFB, TX 78235-5328

FINANCE OFFICE: (SC1010) DFAS-COLUMBUS CENTER
ATTN: INDEPENDANCE
P.O. BOX 182362, COLUMBUS OHIO 43218-2362

18. ☒ CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT ☐ CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN ______ COPIES TO ISSUING OFFICE

19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)
BY

20. NAME AND TITLE OF SIGNER (Type or print)

21. DATE SIGNED

22. UNITED STATES OF AMERICA (Signature of Contracting Officer)
BY Gary J. Macdecy

23. NAME OF CONTRACTING OFFICER (Type or print)
GARY J. MACDECY

24. DATE SIGNED
93 Jun 16

AFMC FORM 702, JUL 92 REPLACES AFSC FORM 702, AUG 84 WHICH IS OBSOLETE

1. Pursuant to the "Changes" Clause of Section I of the basic contract. The ceiling amount for the order is increased by $99,986. from $299, 855. to $399,841. The performance period remains the same, 31 DEC 93,as a result of this change.

2. As a result of paragraph 1 above, said order is more specifically modified as follows:

a. SECTION A - Cover page - The NTE amount in Block 20 (Cover Page) is increased by $99,986. from $299,855. to $399,841.

b. SECTION B - Supplies and Services - Establish Special ACRN XA.

Item No	Supplies/Services		Quantity Purch Unit	Unit Price Total Item Amt
0001	CLIN Change noun: SAMPLING, ANALYSIS, AND DATA acrn: XA nsn: N site codes pqa: D acp: D fob: D type contract: Y	sec class: U		N N
0002	CLIN Change noun: SUPPORT acrn: XA nsn: N site codes pqa: D acp: D fob: D type contract: Y	sec class: U		N N

c. SECTION C - Description/Specs/Work Statement - The SOW for this order remains the same as the Basic order entitled, "Installation Restoration Program/Remedial Investigation/Feasibility Study for Distant Early Warning (DEW) Line Sites and Cape Lisburne AFS, AK" dated 16 MAR 93.

d. SECTION F - Supplies Schedule Data - is modified to include ACRN AB and Special ACRN XA.

Item No	Supplies Schedule Data		Delivery Quantity	Schedule Date
0001	CLIN Del Sch Change acrn: XA ship to: U	sec class: U	1	93DEC31

0002	CLIN Del Sch Change acrn: XA ship to: U	sec class: U	1	93DEC31

e. SECTION G. - Accounting Classification Data - is amended as set forth below:

ACRN	Acct Class Data	Appropriation/Lmt Subhead/CPN Recip DODAAD Supplemental Accounting Classification		Obligation Amount
AB	ACCOUNT ESTABLISH UNCLASSIFIED	5733400 303 7434 434419 000007 53440 000000	F74400 674400	$99,986.00
	pr/mipr data: FY7624-93-08305			
XA	SPECIAL ACRN ESTABLISH UNCLASSIFIED			

descriptive data:
Special ACRN XA funds CLINs 0001 and 0002 and includes the following:

ACRN AA: $299,855.
AB: $ 99,986.
TOTAL $399,841.

Finance Officer: Pay Funds in Alphabetical Order.

3. This supplemental agreement constitutes full settlement of any claims of the contractor under the contract, including the clause entitled, "Changes", arising out of or in connection with the changes effected hereby.

REF 68X 68X

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. PAGE 1 OF 3

2. PROC INSTRUMENT ID NO. (PIIN)	3. SPIIN	4. EFFECTIVE DATE	5. REQUISITION/PURCHASE REQUEST PROJECT NO.	6. BCC/DMS RATING
F33615-90-D-4010	002202	93JUL23	FY7624-93-08353	--

7. ISSUED BY CODE FQ2826

DEPARTMENT OF THE AIR FORCE
AIR FORCE MATERIEL COMMAND
HUMAN SYSTEMS CENTER/PK
8005 9TH STREET
BROOKS AFB TX 78235-5353
Buyer: REBECCA ROUNSAVILL/PKVBA
Phone: (210) 536-4502

8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) CODE S2404A

DCMAO, BALTIMORE
ATTN: CHESAPEAKE
200 TOWNSONTOWN BLVD, WEST
TOWNSON MD 21204-5299

9. CONTRACTOR NAME AND ADDRESS CODE 69148 FACILITY CODE

IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"

ICF TECHNOLOGY
9330 LEE HIGHWAY
FAIRFAX VA 22031-1207
COUNTY; FAIRFAX
PHONE: (703) 934-3000

MAIL DATE
JUL 26 1993

MAILING ADDRESS;
ICF TECHNOLOGY, INC
ATTN: CYNTHIA L. FALCE
FOUR GATEWAY CENTER 12TH FLOOR
PITTSBURGH PA 15222

10. SECURITY CLAS U

11. DISCOUNT FOR PROMPT PAYMENT

1 ST . DAYS NET DAYS
2 ND . DAYS OTHER IF "9"
3 RD . DAYS SEE SECT "E"

12. PURCHASE OFFICE POINT OF CONTACT
MVX/M6V/MVY

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICTCITATIONS

☐ The above numbered solicitation is amended as set forth in block 17. The hour and date specified for receipt of Offers ☐ is extended ☐ is not extended

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods:

(a) By signing and returning ___ copies of this amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

14. THIS BLOCK APPLIES ONLY TO MODIFICATION OF CONTRACTS

☐ THIS CHANGE IS ISSUED PURSUANT TO ___ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVED NUMBERED CONTRACT/ORDER.

☐ THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.

☐ THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF ___ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.

☒ THIS MODIFICATION IS ISSUED PURSUANT TO FAR 52.253-3, Changes - Time and Materials or Labor Hours. (AUG 1987)

15. CONTRACT ADMINISTRATION DATA

A. KIND OF MOD	B. MOD ABST RECIPIENT ADP PT	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PO/CAO ON TRANSFER	F. GAINING PO/CAO ON TRANSFER	G. SVC/AGENCY USE
C			$			

16. ENTER ANY APPLICABLE CHANGES

A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1) TYPE (2) KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE	H. DATE SIGNED	I. SECURITY (1) CLAS (2) DATE OF DD 254

17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.) SUBJ: INCREASE IN CEILING AMOUNT
PROJECT OFFICER: MICHAEL F. MCGHEE, AFCEE/ESR, 8001 INNER CIRCLE, SUITE 2, BROOKS AFB, TX 78235-5328
FINANCE OFFICE: (SC1030) DFAS-COLUMBUS CENTER
ATTN: DFAS-CO/CHESAPEAKE DIVISION
P.O. BOX 182264, COLUMBUS OHIO 43218-2264

18. ☒ CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT ☐ CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN ___ COPIES TO ISSUING OFFICE

19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)
BY

22. UNITED STATES OF AMERICA (Signature of Contracting Officer)
BY Gary J. Macdecy

20. NAME AND TITLE OF SIGNER (Type or print)

21. DATE SIGNED

23. NAME OF CONTRACTING OFFICER (Type or print)
GARY J. MACDECY

24. DATE SIGNED
93 Jul 23

AFMC FORM 702, JUL 92 REPLACES AFSC FORM 702, AUG 84 WHICH IS OBSOLETE

REFERENCE: AF Form 616 H93-SR329, DATED: 9 JUL 93; EXPIRES: 15SEP 93; $2,9M

1. Pursuant to the "Changes" Clause of Section I of the basic contract. The ceiling amount for the order is increased by $2,899,511.00 from $399,841.00 to $3,299,352.00. The performance period is changed to 94 Feb 15, as a result of this change.

2. As a result of paragraph 1 above, said order is more specifically modified as follows:

a. SECTION A Cover page - The NTE amount in Block 20 (Cover Page) is increased by $2,899,511.00 from $399,841.00 to $3,299,352.00.

b. SECTION B - Supplies and Services - Establish Special ACRN XA.

Item No	Supplies/Services	Quantity Purch Unit	Unit Price Total Item Amount
0001	CLIN Change sec class: U noun: SAMPLING, ANALYSIS AND DATA acrn: XA nsn: N site codes pqa: D acp: D fob: D type contract: Y		N N
0002	CLIN Change sec class: U noun: SUPPORT acrn: XA nsn: N site codes pqa: D acp: D fob: D type contract: Y		N N
0004	CLIN Establish sec class: U noun: CHEMICAL ANALYSES acrn: XA nsn: N site codes pqa: D acp: D fob: D pr/mirp Data: FY7624-93-08353 type contract: Y	1 LO	N N

c. SECTION C - Description/Specs/Work Statement - The SOW for this order entitled, "Installation Restoration Program Remedial Investigation/Feasibility Study, Stage 1, Distant Early Warning (DEW) Line Sites and Cape Lisburne AFS, AK", dated 6 JUL 93 is attached hereto as Attachment #1 to this modification.

d. SECTION F - Supplies Schedule Data is modified to include ACRN AB and Special ACRN XA.

Item No	Supplies Schedule Data		Delivery Quantity	Schedule Date
0001	CLIN Del Sch Change acrn: XA ship to: U	sec class: U	1	95JANØ1
0002	CLIN Del Sch Change acrn: XA ship to: U	sec class: U	1	95JANØ1
0004	CLIN Del Sch Establish acrn: XA ship to: U	sec class: U	1	95JANØ1

e. SECTION G - Accounting Classification Data - is amended as set forth below:

ACRN	Acct Class data	Appropriation/Lmt Subhead/CPN Recip DODAAD Supplemental Accounting Classification	Obligation Amount
AB	ACCOUNT CHANGE UNCLASSIFIED pr/mipr data:	5733400 F74400 303 7434 434419 000007 53440 000000 674400	$2,899,511.00+
XA	SPECIAL ACRN CHANGE UNCLASSIFIED		

descriptive data:
Special ACRN XA funds CLINs 0001, 0002 and 0004 and includes the following:

ACRN AA:	$ 299,855.00	
AB:	$ 99,986.00	(MOD 0022-01)
	$2,899,511.00	(MOD 0022-02)
TOTAL	$3,299,352.00	

FINANCE OFFICER: Pay funds in alphabetical order.

3. This supplemental agreement constitutes full settlement of any claims of the contractor under the contract, including the clause entitled, "Changes", arising out of or in connecting with the changes effected hereto.

1993 JUL 6

STATEMENT OF WORK
INSTALLATION RESTORATION PROGRAM
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

STAGE 1

DISTANT EARLY WARNING (DEW) LINE SITES and CAPE LISBURNE AFS, AK

I. DESCRIPTION OF WORK

1.1 Scope

1.1.1 **Background.** The objective of the Air Force Installation Restoration Program (IRP) is to assess past hazardous waste disposal and spill sites on Air Force installations and develop remedial actions consistent with the National Contingency Plan (NCP) for those sites which pose a threat to human health and welfare or the environment. This objective is achieved through a Remedial Investigation Feasibility Study (RI/FS) process in which conclusions and recommendations drawn from accurate and validated data are used to structure and guide subsequent activities.

The RI/FS process includes scoping to define data requirements and objectives, a remedial investigation to characterize sites for a baseline risk assessment, and a feasibility study to define and evaluate alternative remedial actions so that a recommended action may be selected. Each of these steps of the RI/FS process can be conducted in stages that focus on particular aspects of the process.

The contractor shall accomplish the actions described in this Statement of Work (SOW) to complete the RI/FS process at the following seven Dew Line Sites and Cape Lisburne:

Barter Island AFS (BAR-M); Bullen Point AFS (POW-3); Point Lonely AFS (POW-1); Point Barrow AFS (POW-M); Point Lay AFS (LIZ-2); Wainwright AFS (LIZ-3); and Oliktok Point AFS (POW-2).

1.1.2 **Requirements for Project Activities.** The Installation Restoration Program (IRP) Handbook referenced in this Statement of Work provides requirements for laboratory and field activities and applicable formats for project documents that shall be used by the contractor. Volume 1 of the Handbook dated May 1992 is provided under separate cover. This document is referenced in this Statement of Work as the Handbook.
The contractor is responsible for the thorough knowledge and understanding of the previous findings and recommendations that affect this task prior to the start of field activities. The documents involved include but are not limited to the IRP Phase I Records Search, and the IRP Phase II plans and reports addressing the Dew Line Sites and Cape Lisburne.

1.1.3 **Meetings.** A maximum of two (2) contractor personnel, including the project leader, shall attend ~~four (4)~~ eight (8) meetings at Elmendorf AFB, AK. Each meeting shall be two (2) 8-hour workdays in duration. All meetings shall be coordinated by the Restoration Team Chief (RTC).

1.1.4 **Special Notifications.** The contractor shall immediately report to the RTC, or designate, via telephone, any data or results generated during this investigation which may indicate an imminent health risk. Following this telephone notification, a written notice shall be prepared and

delivered within three (3) days. This notification shall include supporting documentation (sequence 16, para 6.1)

1.2 Project Scoping Documents

The purpose of the project scoping documents is to clearly and comprehensively define project activities prior to the initiation of field work. The contractor shall prepare and submit the following project scoping documents for this task prior to the initiation of any field activities or laboratory analyses.

1.2.1 **Engineering Network Analysis.** Provide within ten (10) days after the issuance of an order a computer generated network analysis which is a detailed task plan for the RI/FS work efforts. The network analysis (GANTT) chart shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period of the delivery order. The network analysis (GANTT) shall show both serial and parallel subtasks leading to a deliverable product or report, and shall show early and late start and completion dates with float. The network analysis (GANTT) shall be updated and submitted quarterly (sequence 3, para 6.1).

1.2.2 **Work Plan.** This section will discuss the overall approach, (including a brief summary of the Conceptual Site Model and Data Quality Objectives), major tasks, scope, timeline, and major decision points. Due to the extreme remoteness of the Dew Line Sites and Cape Lisburne, the contractor shall include a detailed plan for logistics and strategy to complete the RI/FS field activities. Follow the format specified in section 1 of the Handbook. In preparing the Work Plan, use previous reports and the information gathered during the literature search and presurvey along with experience at similar sites. Reevaluate the recommendations for Dew Line Sites and Cape Lisburne developed during previous IRP stages (sequence 4, para 6.1).

1.2.3 **Sampling and Analysis Plan (SAP).** The SAP consists of a quality assurance plan (QAPP) and a Field Sampling Plan (FSP). Prepare a SAP describing how project activities will be accomplished in the format specified in section 1 of the Handbook. Incorporate review comments and obtain RTC concurrence prior to the start of field activities (sequence 4, para 6.1).

1.2.4 **Health and Safety Plan (HSP).** Provide a written Health and Safety Plan within eight (8) weeks after the issuance of an order. The contractor shall comply with USAF, OSHA, EPA, state, and local health and safety regulations regarding the proposed work effort. Use EPA guidelines for designating the appropriate levels of protection needed at the study sites. The Health and Safety Plan shall provide no less protection than the protection contained in the manual entitled "Health and Safety Requirements for Employees Engaged in Field Activities" dated 1981 and the "Occupational Safety and Health Manual for Hazardous Waste Sites Activities" dated 1985 and 29 CFR 1910. Coordinate the Health and Safety Plan directly with applicable regulatory agencies prior to submittal to AFCEE/ESR. The contractor shall certify to AFCEE/ESR that the contractor has reviewed the coordinated Health and Safety Plan with each employee and also subcontractor's employees prior to the time each employee engages in field activities (sequence 4, para 6.1).

1.2.5 **Community Relations Plan.** The contractor shall prepare a Community Relations Plan (CRP) for the DEW Line Sites and Cape Lisburne AFS outlining the specific public communications and involvement techniques to be used in coordination with remedial site activities (sequence 4, para 6.1). Follow the guidance contained in "Community Relations in Superfund, a Handbook", office of Solid Waste and Emergency Response (OSWER) Directive

9230.0-03C (EPA/540/R-92/009, January 1992, PB92-963341), and other applicable directives. Also, use as a guidance previously accomplished CRP from other installations in Alaska. Appropriately adapt such guidance to the local situation at the DEW Line Sites and Cape Lisburne. As described in OSWER Directive 9230.0-03C, the CRP shall include, but not be limited to, a description of the sites and the community, an overview of the community involvement to date, key community concerns regarding the site and AF site activities, and suggested community relations activities. A contact list of elected officials, agency representatives, and interested groups and individuals shall be included in appropriate copies of the plan. In addition, the plan will include suggested locations for meetings and information repositories. Contractor activities to develop the CRP shall include conducting a review of site information provided by the AF.

1.3 Project Activities

The contractor shall conduct the following tasks to achieve the purposes stated herein, in compliance with approved scoping documents, the Handbook, and all applicable regulations and requirements.

1.3.1 **Community Relations.** Provide support to the base public affairs office for the tasks described below pertaining to the RI/FS Community Relations Program.

1.3.1.1 Public meetings and workshops. The contractor shall be responsible for coordinating public meetings and workshops for all DEW Line Sites and Cape Lisburne AFS. This includes producing briefing scripts, slides and any associated products such as response cards and sign-in sheets. As requested by the base Community Relations office in coordination with the RTC, research and provide materials for public queries, news media queries, and news releases. Assume a maximum of one (1) workshop/meeting (Seq. nos. 3,9).

1.3.1.2 Public notices. As required by the base Community Relations office and the RTC, the contractor shall prepare and publish public notices for the Fairbanks and local newspapers. The purpose of these notices is to inform the public of a meeting, workshop, or comment period in which they have the opportunity to be involved in the IRP Program at DEW Line Sites and Cape Lisburne AFS. Also, these notices may be utilized to inform the public of other pertinent program information such as quarterly notices of documents placed in the information repositories. The format for the notices shall be coordinated with the Community Relations office and RTC, and then submitted to the RTC for review prior to delivery to the base. Assume a maximum of two (2) notices (Seq. no. 3).

1.3.1.3 Photo Notebook. The contractor shall develop a photo notebook which focuses on the overall IRP program at DEW Line Sites and Cape Lisburne AFS. The layout of the notebook will be coordinated with the public affairs office and RTC. Assume a maximum of one (1) update (Seq. no. 9).

1.3.1.4 Mailing List. In coordination with the base Community Relations office and the RTC, prepare and update the mailing list on a quarterly basis. Assume a maximum of two (2) updates (Seq. no. 3).

1.3.1.5 Maps. Prepare presentation quality maps of the installations and their sites to use in newsletters and to distribute to the public.

1.3.1.6 Information Repository/Administrative Record. Prepare a listing of all documents required for the Information Repository and Administrative Record. Create an Informatin Repository and Administrative Record. The Reporsitory and Record will be maintained by the 11 CEOS/CEVR Community Relations Coordinator. Assume two locations for the Repository and Record, one in Anchorage and another in Elmendorf AFB, AK. Actual locations will be determined by the 11 CEOS/CEVR Community Relations Coordinator.

1.3.2 **Literature Search.** Conduct a literature search and analyze aerial photos of the DEW Line Sties to supplement existing information that has been collected. The purpose of the literature search is to complete the conceptual site model so that a numerical estimate of risk can be developed.

1.3.3 **Presurvey.** Within eight weeks of the issuance of an order, the contractor shall visit the Dew Line Sites and Cape Lisburne to ensure complete understanding of site conditions. Coordinate this visit with the RTC and the 11 CEOS project manager. The contractor shall look for evidence of contamination at each site visited (e.g., leaking drums, vegetative stress, leachate seeps). The contractor shall observe the physical settings of each site visited to formulate specific recommendations concerning boring placement, use of geophysical techniques, and other aspects of the proposed field investigation. The findings of the presurvey shall be used to prepare the Work Plan, SAP, and HSP for the RI and to prepare scoping documents for the treatability study(ies). Assume one presurvey and one reconnaisance trips.

1.3.4 **Quality Assurance/Quality Control (QA/QC).** A QA/QC program shall be conducted and documented for all work pursuant to this delivery order. Contractor and project-specific documents concerning QA/QC procedures and requirements shall be strictly followed. Data generated under the QA/QC program shall be used by the contractor for evaluating the analytical results and field records assembled for each site to identify accurate and validated data that may be used to assess risk, develop conceptual site models and evaluate alternatives.

1.3.5 **Conceptual Site Model.** Use all available RI/FS data supported by acceptable QA/QC results (as measured against QAPP requirements) and site characterization information to refine, based on newly collected data, the conceptual site model. The model shall define the nature and extent of contamination and the transport and fate of those contaminants. The minimum requirements of the model are given in section 2 of the Handbook. The complexity and detail of the site model shall be consistent with the nature of the site and site problems, and the amount of data available the conceptual site model shall be documented in the Work Plan.

1.3.6 **ARARs Evaluation.** The contractor shall identify all Applicable or Relevant and Appropriate Requirements (ARAR). These ARARs will be documented in the Work Plan.

1.3.7 **Data Collection, Sampling, and Analysis Procedures.** The contractor shall conduct field activities, sampling, laboratory analysis, and data quality assessment. Section 2 of the Handbook is recommended for the contractor to follow. The contractor shall conduct all activities in accordance with the WP and the SAP approved by the COR. The COR shall be notified in writing of any planned deviation from the activities specified in these documents. COR approval of deviations is required prior to performance.

The field investigation (including all drilling and sampling operations) shall be supervised by a registered geologist, hydrogeologist, or professional engineer. If required by the state, the on-site field supervisor shall be

certified by the state to install test wells. A detailed log of field conditions, materials penetrated during drilling, well completion, and sampling conditions, as described in Section 2 of the Handbook, shall be maintained and made available for Government inspection upon request. Decisions on well and boring locations, well depths, screened intervals, and all details of the field investigation shall be made by the COR, and the contractor's field or project supervisor.

1.3.8 **Regulatory Requirements and Permits.** All well drilling, development , sampling, laboratory analysis, and other activities pursuant to this effort shall be conducted in strict accordance with all applicable federal and state laws, ordinances, rules and regulations, and all authorities with jurisdiction over such activities. The contractor shall complete permits, applications, other documents, and proficiency tests required by the regulatory agencies. The contractor shall file documents with appropriate agencies and pay all applicable permit and filing fees. The contractor shall identify locations requiring permits to Radar Station Manager. The contractor shall include all correspondence in appendices to the technical reports in accordance with Section 4 of the Handbook.

All laboratory analyses shall conform to all applicable federal, state, and local regulatory agency requirements. If the requirements specify that certification is necessary to conduct one or more specific analyses, the contractor shall furnish documentation showing laboratory certification with the first set of analytical data supplied to AFCEE/ESR and the COR.

The contractor shall containerize and sample materials suspected to be hazardous in accordance with applicable requirements, Guidance from the Handbook, and the approved Plans. The contractor shall transport these containerized materials to a location within the installation boundary designated by the Radar Station Manager at a frequency specified by the Station Manager. The contractor shall handle, store, and/or dispose of potentially hazardous materials. The contractor shall transport and empty containerized materials determined not to be hazardous to locations within the installation boundary identified by the Station Manager.

1.3.9 **Remedial Investigation (RI).** The contractor shall conduct a RI to characterize environmental conditions; define the concentration, nature, and extent of contamination; and quantitatively estimate the risk to human health and the environment and study the area through the collection of geologic and hydrologic data, environmental samples, the laboratory analyses of those samples for potential contaminants, the evaluation of the analytical results and field measurements with respect to quality control data, and the interpretation and analysis of accurate and precise data. The purpose of data collection, sample collection, and laboratory analysis is to determine whether any contaminants generated from installation activities have entered the environment. The field investigation is used to determine the source of any identified contaminants, the magnitude of contamination relative to Applicable or Relevant and Appropriate Requirements (ARARs), and any naturally occurring or background concentrations for specific compounds. The RI shall comply with the specifications, procedures, and methodologies presented in the project-specific SAP. The COR must be notified in writing prior to any modification of or deviation from any activity described in these documents.

1.3.9.1 **Soil Borehole Drilling and Sampling and Well Installation and Sampling.** The contractor shall drill and collect samples from boreholes as specified in the SAP. The contractor shall evaluate the need to install, sample, and develop monitoring or extraction wells.

1.3.9.1.1 **Lithologic Samples.** The contractor shall describe core samples at least every five (5) feet of drilling or at each change in lithology, whichever is less, to indicate significant changes in lithology of characteristic properties that relate to the strata penetrated. Any deviations shall be coordinated with the COR. Guidance for standard identification practices are found in the Handbook. The contractor shall include in the field logbook observations made by the driller and rig geologist during drilling such as depth to water, penetration rate, drill rig behavior, and other observations that might be indicative of changes in formation characteristics. The contractor shall record depth to permafrost in all the soil borings and shall not proceed beyond five (5) feet into the permafrost layer.

1.3.9.1.2 **Drill Cuttings and Drilling Fluids.** The contractor shall containerize all drill cuttings and drilling fluids. All drill cuttings and drilling fluids shall be managed and disposed of in accordance with the project SAP. (Note: The contractor shall be responsible for providing all necessary containers.) The contractor shall be responsible for the logistics of the ultimate disposal of all drill fluids or drill cuttings deemed hazardous in accordance with current EPA off-site disposal policy and state and/or local hazardous waste disposal laws. The contrator shall coordinate with the Station Manager for on-site placement and disposal of all drill cuttings, fluids, purge fluid, and excavated material. If on-site disposal is excluded, all hazardous waste shall be transported by a permitted hazardous waste transporter to a licensed Resource Conservation and Recovery Act (RCRA) approved facility and be accompanied by a Uniform Hazardous Waste Manifest. The contractor shall provide a final, completed copy of the hazardous waste manifest to the 11 CEOS/CEVR. The Radar Stations' hazardous waste managers will sign all hazardous waste manifest documents.

1.3.9.1.3 **Well/Boring Precautions.** The contractor shall mark the field locations of all borings during the planning/mobilization phase of the field investigation. The contractor shall consult with base personnel to minimize the disruption of base activities, to properly position wells with respect to site locations, and to avoid penetrating underground utilities. The contractor shall obtain all permits prior to commencement of digging and drilling operations. The contractor shall utilize a registered land surveyor in determining the elevations and locations of all off-base background study borings. All borings and wells from which samples are taken shall be surveyed by the contractor for vertical and horizontal control. The contractor shall record the positions on project and site specific maps. Bench marks used must have been previously established from and be traceable to a U. S. Coast and Geodetic Survey (USCGS) or U. S. Geological Survey (USGS) survey marker. Clearly identify all bench mark locations on the base map.

1.3.9.1.4 **Water-Level Measurements in Boreholes.** The contractor shall measure water levels in all boreholes after the water level has stabilized. Include this information and the date of measurement in the boring logs. Also, record soil moisture conditions (moist, wet, saturated, etc.) in the boring log.

1.3.9.1.5 **Air Monitoring During Drilling.** The contractor shall monitor the ambient air in the breathing zone above the borehole during all drilling with an appropriate organic vapor analyzer to identify potentially hazardous and/or toxic vapors. Include air monitoring results in borehole logs.

1.3.9.1.6 **Subsurface Soil Sampling.** The contractor shall collect soil samples from borings as specified in the SAP. The SAP specifies the analytical methods, the parameters for analysis, and the estimated number of analyses for soil samples.

1.3.9.1.7 **Well Construction Requirements.** The contractor shall coordinate with the COR to determine well completion requirements (flush or projected above ground surface). All wells shall be secured as soon as possible after drilling. The contractor shall provide corrosion resistant locks for both flush and above-ground well assemblies. The locks shall be compatible with existing wells. The contractor shall turn the lock keys over to 11 CEOS/CEVR POC following completion of the field effort. The contractor shall coordinate with the 11 CEOS/CEVR POC, the RTC, and the COR the selection of exact well and screen placement, gravel pack design, and screen slot size.

1.3.9.1.8 **Well Logs.** For each well, the contractor shall prepare a well completion log and schematic diagram showing well construction details. Lithologic descriptions, well elevation survey data, and other information included in the well logs shall conform to the specifications of the SAP.

1.3.9.1.9 **Well Development.** The contrator shall develop each well as soon as possible. Guidance for well development procedures are found in the the Handbook. The contractor shall measure the rate of water production, pH, specific conductance, and water temperature during well development.

1.3.9.1.10 **Well Placement.** The contractor shall avoid installing wells in depressions or areas subject to frequent flooding and/or standing water. If wells must be installed in such areas, the contractor shall design the wells so standing water does not leak into the top of the casing or cascade down the annular space.

1.3.9.1.11 **Well and Borehole Clean-up.** The contractor shall clean the area following the completion of each well and borehole. The contractor shall return all sites to the original condition of the site.

1.3.9.1.12 **Groundwater and Surface Water Sampling.** The contractor shall collect groundwater and Surface Water samples from newly developed well and existing wells and from surface water bodies. The SAP shall specify the analytical methods, the parameters for analysis, and the estimated number of analyses for groundwater and surface water samples.

1.3.9.1.13 **Composite Sampling.** The contractor shall collect and analyze drill cuttings, fluids, purge fluids, and excavated material. The SAP shall specify the analytical methods, the parameters for analysis, and the estimated number of analyses for composite samples.

1.3.9.2 **Geophysical Surveys.** The contractor shall evaluate whether geophysical surveys are needed (e.g., to determine boundaries of landfills, to locate underground debris, utilities and storage tanks). Where geophysical surveys are appropriate, the contractor shall select a geophysical survey technique or techniques [such as ground penetrating radar (GPR), magnetometer or electromagnetic surveys (EM)] that will best meet the desired application. The technique(s) used shall be approved by the RTC prior to use. Approximate number of surveying days is included in Annex A which is to be used for costing purposes only. Appropriate grid systems shall be established and the contractor shall use the results of this survey to prepare a contour map of the results. Provide this map as an attachment to the first R&D Status Report

submitted after the completion of the geophysical surveys. The contractor shall perform the geophysical surveys before drilling and use the results in selecting the location of soil borings, wells, test pits, if necessary.

1.3.9.3 **Permeability Testing.** The contractor shall determine the need for a permeability test at Cape Lisburne AFS, to provide additional data on the hydrogeologic characteristics of the water table aquifer. The SAP shall specify the method to be used for the permeability test.

1.3.9.4 **Water Level Measurement.** The contractor shall evaluate the need for conducting a complete round of water level measurements in all existing and new wells at Cape Lisburne AFS at the beginning of field work and during the field sampling effort. Data gathered shall be used for interpreting groundwater flow directions and groundwater gradient.

1.3.9.5 **Soil Gas Surveys.** The contractor shall evaluate the need for soil gas surveys and Hydropunch (e.g., to select soil boring locations). If soil gas surveys and hydropunch are included as part of the approved Work Plan and FSP, the contractor shall establish appropriate grid systems. The contractor shall prepare a posting map of soil gas values relative to their location on the grid used. Provide this map as an attachment to the first R&D Status Report submitted after completion of the soil gas survey (sequence 3, para 6.1). Approximate number of surveying days are included in Annex A which is to be used for costing purposes only.

1.3.9.6 **Groundwater Field Screening.** The contractor shall perform groundwater field screening. The SAP shall specify the method, location, and type of groundwater field screening.

1.3.9.7 **Baseline Risk Assessment.** The contractor shall use data supported by acceptable QA/QC results (as measured against QAPP requirements) and the conceptual site model to numerically estimate the risk posed by site contaminants to human health and the environment. The contractor shall identify and list all ARARs for those contaminants detected in environmental samples at the site. The contractor shall provide all ARARs evaluations as an attachment to the Technical Report. Provide the results of the baseline risk assessment in the Technical Report using the formats in Section 4 of the Handbook as a guidance.

The contractor shall identify those sites posing minimal or no threat to human health, welfare, or the environment and for which no further action is appropriate.

The contractor shall use the results of the risk assessment in establishing remedial action objectives and developing remedial alternatives in the Feasibility Study.

1.3.9.8 **Defense Priority Model Scores.** The contractor shall use the Defense Priority Model to score the sites. The score shall be included as an appendix to the RI/FS Technical Report.

1.3.9.9 **Fate and Transport.** The contractor shall perform fate and transport modeling for contaminants of interest to include the projection of future contaminant concentrations within the boundaries of the site. This will be done in conjunction with the RI/FS report.

1.3.13 **Weekly Field Activity Report**

The contractor shall transmit a Weekly field activity report. The AFCEE RTC shall develop the format for the report.

1.4 **Project Deliverables**

Deliver the following documents in compliance with the requirements of item VI, the formats required in section 1 and 4 of the Handbook, and the specifications noted below. Draft reports are considered "drafts" only because they have not been reviewed and approved by the Air Force. In all other respects, "drafts" shall be complete, in the proper format, fully illustrated, and free of grammatical and typographical errors.

1.4.1 **Scoping Documents.**

a. Engineering Network Analysis (GANTT) (para 1.2.1). Provide within ten (10) days after the issuance of an order. Update and submit quarterly (sequence 3, para 6.1).

b. Work Plan (para 1.2.2). Use the format in section 1 of the Handbook (sequence 4, para 6.1).

c. Sampling and Analysis Plan (1.2.3). Use the format in section 1 of the Handbook (sequence 4, para 6.1).

d. Health and Safety Plan (para 1.2.4). Provide within six (6) weeks after the issuance of an order (sequence 4, para 6.1).

e. Community Relations Plan (para 1.2.5). Provide within eight (8) weeks after issuance of an order (sequence 4, para 6.1).

1.4.2 **Special Notification.** Provide written notification of imminent health hazards and supporting documentation within three (3) days of telephone notification (sequence 16, para 6.1).

1.4.3 **Presentation Materials.** The contractor shall prepare and present up to two (2) presentation packages at meetings coordinated by the Air Force (sequence 9, para 6.1). Attendance of these meetings is included in paragraph 1.1.3 of this SOW. As part of the presentation materials, the contractor shall provide paper copies of all slides and overheads.

1.4.4 **Meeting Summaries** (para 1.1.3). Provide no later than five (5) days after conclusion of each meeting (sequence 18, para 6.1).

1.4.5 **Newsletter.** Prepare and submit a quarterly newsletter which presents the status of the entire base IRP Program. This will include preparing an outline resulting from input by all contractors involved in the program. The outline must be approved by the base and RTC prior to submittal of the newsletter. The final product will be printed and distributed as agreed to by the RTC. Assume a maximum of two (2) newsletters (Sequence no. 3).

1.3.10 **Feasibility Study (FS).** The contractor shall perform a FS concurrently with the RI. As much of the FS as possible shall be performed early in the RI/FS process and refined as additional RI data are obtained. The contractor shall use the information from the RI and the baseline risk assessment to develop and evaluate remedial action alternatives for each site where a threat to human health or the environment exists. The contractor shall follow the procedures specified in USEPA OSWER Directive 9355.3-01, "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA." The contractor shall employ streamlining methods wherever possible and develop and evaluate the minimum number of alternatives needed to provide a range of promising treatment and containment actions. The contractor shall eliminate impracticable alternatives from further consideration early in the FS process. The scope and level of detail shall be consistent with the nature and complexity of site problems.

1.3.10.1 **Develop and Screen Alternatives.** The contractor shall establish remedial action objectives and remediation goals for protecting human health and the environment. These objectives and goals shall be determined based on identified ARARs and acceptable exposure levels as defined in the baseline risk assessment and refined throughout the RI/FS process. Identify general response actions and applicable technologies based on site and contaminant conditions, and combine technologies to formulate distinct alternatives. The contractor shall develop alternatives which eliminate, control, and /or reduce risk to human health or the environment to acceptable levels for each pathway. Where a wide variety of promising alternatives exists, the contractor shall screen the alternatives based on effectiveness, implementability, and cost. The contractor shall detail the development and screening of the alternatives process and identify the alternatives selected for detailed analysis in the Informal Technical Information Report (ITIR).

1.3.10.2 **Detailed Screening of Alternatives.** The contractor shall conduct a detailed analysis on each alternative selected and identified in the above step and approved by the COR. Using the methodology in OSWER Directive 9355.3-01, the contractor shall evaluate each alternative against the nine criteria. In addition to the individual assessment, the contractor shall perform a comparative analysis to determine the relative performance of alternatives. The contractor shall focus the analysis on sub-factors and criteria most pertinent to each site and the scope and complexity of the proposed action. Provide a summary of the Detailed Analysis of Alternatives in the R&D report submitted following task completion. Include summary tables of the individual and comparative analyses that will be used in the Technical Report.

1.3.11 **Desicion Documents.** The contractor shall prepare and submit Decision Documents (DD) following the Handbook Section 4.4 as guidance. The purpose of the DD is to support a remedial action alternative or a no further action alternative.

1.3.12 **Site Specific Requirements.** The contractor shall perform the requirements listed in this SOW in conformance with the guidance of the Handbook, requirements of the approved WP, and the SAP. Annex A specifies the proposed values for field and laboratory activities to be conducted, specifications for field activities, information for sediment and soil samples, analytical methods, parameters for analysis, estimated number of analyses for water/sediment/soil samples, required analytical methods, estimated number of analyses for all core samples, estimated number soil gas analyses for each parameter, and field QC sample requirements for soil and water samples for costing purposes only.

1.4.6 **Fact Sheets.** As required by the base IRP Program, prepare and submit fact sheets which facilitate the public's understanding of the IRP Program. These sheets should include key community concerns regarding sites as specified by the base. Use the format agreed to by the base and RTC. Print and distribute the fact sheets as agreed to by the RTC. Assume a maximum of two (2) fact sheets (Sequence no. 3).

1.4.7 **Public Notices.** In accordance with paragraph 1.3.6.2, prepare and submit public notices for the Fairbanks and local newspapers. Use the format agreed to by the base and RTC (Sequence no. 3).

1.4.8 **Photo Notebook.** In accordance with paragraph 1.3.6.3, develop a photo notebbok which focuses on the overall base IRP Program. Prior to implementation, submit a conceptual layout of the notebook for review by the base and RTC (Sequence no. 9).

1.4.9 **Mailing List.** In accordance with the base Community Relations coordinator and paragraph 1.3.6.4, update the existing mailing list on a quarterly basis (Sequence no. 3).

1.4.10 **Maps.** In accordance with the base community Relations coordinator and paragraph 1.3.6.5, prepare presentation quality maps.

1.4.11 **Information Repository/Administrative Records.** Submit the Information Repository and Administrative Records in accordance with Air Force Guidance and in concurrance with the COR and the base Community Relations Coordinator. (sequence no. 4, para 6.1)

1.4.12 **Data Management.** The contractor shall meet the data deliverable requirements of the Installation Restoration Program Information Management System (IRPIMS). The contractor shall be responsible for recording field and laboratory data into a computerized format as required by the most current version of the IRPIMS Data Loading Handbook (mailed under separate cover). In order to perform this task, the contractor shall use the IRPIMS Quality Control Tool (QC Tool) and PC software utility (mailed under separate cover with software manual) to quality check ASCII data files and to check all data files for compliance with requirements in the IRPIMS Data Loading Handbook. Upon request, the IRPIMS Contractor Data Loading Tool (CDLT) is available. This PC software is designed to assist the contractor in preparing the various ASCII data files.

Individual IRPIMS data files (e.g., analytical results, groundwater level data, etc.), including resubmissions, shall be delivered with a transmittal letter by the contractor to the Air Force Center for Environmental Excellence (AFCEE) in sequence according to a controlled time schedule as identified in the current version of the IRPIMS Data Loading Handbook. The contractor shall include a copy of the Quality Control Tool error report, i.e., output from the QC tool, for each IRPIMS file submission. The error report shall be submitted both in hard copy and as an electronic file on the submission disks with the filename of the error report identified in the transmittal letter (SEQUENCE No. 3).

All contractor data deliverables shall be sent to:

AFCEE/ESD BLDG 624W
ENVIRONMENTAL RESTORATION DIVISION
ATTN: IRPIMS Data Management
Brooks AFB, TX 78235-5000

In addition, the contractor shall provide a copy of the transmittal letter to the Air Force contracting office responsible for the contract, HSC/PKV (Brooks AFB, TX, 78235-5000) for AFCEE contracts. This letter shall identify the files included or otherwise omitted (with an appropriate explanation), the Government contract and delivery order number, and the Air Force POC that is responsible for monitoring the Government contract.

The contractor shall be responsible for the accuracy and completeness of all data submitted. All data entered into the IRPIMS data files and submitted by the contractor shall correspond exactly with the data contained in the original laboratory reports and other documents associated with sampling and laboratory contractual tasks.

Each file delivered by the contractor will be electronically evaluated by AFCEE/ESD for format compliance and data integrity in order to verify acceptance. All files delivered by the contractor are required to be error-free and in compliance with the IRPIMS Data Loading Handbook. Any errors identified by AFCEE/ESD in the submission shall be corrected by the contractor.

1.4.13 **Decision Document.** The contractor shall prepare and submit DD as described in Section 1.3.11 (SEQUENCE No. 4, para 6.1).

1.4.14 **Technical Reports.** Summarize the findings of the tasks pursuant to the SOW, integrate them with the results of all pertinent previous studies, and formulate conclusions and recommendations for future efforts in Technical Reports.

1.4.14.1. **Remedial Investigation (RI) Report** (para 1.3.3). Provide a RI Report following the format in section 4 of the Handbook (sequence 4, para 6.1).

1.4.14.2. **Risk Assessment (RA) Report** (para 1.3.3.7). Provide a RA Report following the format in section 4 of the Handbook (sequence 4, para 6.1).

1.4.14.3 **Feasibility Study Report** (para 1.3.4). Provide a Feadsibility Study Report foillowing the format in section 4.0 of the Handbook. (sequence 4, para 6.1).

1.4.14.4 **RI/FS Technical Report** (para 1.3.3). Provide a RI/FS Technical Report following the format in section 4.0 of the Handbook. The RI/FS Technical Report shall integrate the RI, RA, and FS reports. Provide two microfiche copies with the final RI/FS Technical Report (sequence 4, para 6.1).

1.4.15 **Basewide Comprehensive IRP Document.** The contractor shall develop a comprehensive document that summarizes both the historic and projected IRP activities. This document shall be used as managment tool to efficiently guide future IRP activities at the DEW Line Sites and Cape Lisburne AFS. The contractor shall follow the outline developed by the AFCEE RTC. Assume two (2) updates (sequence no. 4)

1.4.16 **Analytical Data ITIR.** Prepare and submit the following ITIR's:

a. Development & Screening of Alternatives (para. 1.3.10.1). Submit the results of the development and screening of alternatives in an ITIR prepared in compliance with section 3 of the Handbook (sequence 3, para 6.1)

b. Detailed Screening of Alternatives (para 1.3.10.2).

c. DPM Scoring (para 1.3.9.8). Provide scores, a summary of procedures and assumptions, and Automated DPM output tables for all sites scored with DPM (sequence 3, para 6.1).

d. Mylar[R] Map. Construct Radar Stations' maps of Mylar using guidelines in section 3 of the Handbook. The Maps shall contain all sites and related water and sediment sampling locations (sequence no.3, para. 6.1). The contractor shall create and update digitized map files. Use the digitized data file to produce the Mylar map. The contractor shall print the revision date on the Mylar maps and the date shall be encoded in the digitized data file. Provide a copy of the revised digitized data file to AFCEE-ESO/ER (sequence 1, para. 6.2).

e. Geophysical Survey Contour Map (para 1.3.9.2). Provide a contour map showing geophysical survey results. Interpret the significance of the data in the R&D Status Report (sequence 3, para 6.1).

f. Soil Gas Map (para 1.3.9.5). Provide site maps showing soil gas data superimposed on the sampling locations and incorporate soil gas data generated by the 11 CEOS/CEOR. Interpret the significance of the data in the R&D Status Report (sequence 3, para 6.1).

g. Site Characterization Summary Informal Technical Information Report (SCS ITIR). The contractor shall prepare the report to include the following components:

1. Source identification and contaminant delineation.

2. Identification and ranking of appropriate treatability studies for the listed sites.

3. Data and interpretations integrating the findings of the current study and all previous RI efforts at the sites.

4. Current isoconcentration plots of contaminants detected at each site, lithologic logs of each boring showing contaminants detected and relationship to other borings in the site, and cross-sections of the site showing contaminant distribution.

5. The contents and objectives of a Site Characterization Summary Informal Technical Information Report (ITIR) are specified in the Handbook. The Site Characterization Summary ITIR shall serve as a core document for the RI report. The contractor shall submit an annotated outline of each section of the ITIR for approval by the TPM prior to preparation of the report itself. The contractor shall prepare the report as specified in the accepted annotated outline. The contractor shall submit newly revised portions of the working draft ITIR in order to make available current site characterization data. A prime objective shall be to minimize the volume of comments on the working draft and final submittals by incorporating comments into the report in an on-going manner. The final summary shall contain all sites included in this effort (Sequence No. 4).

h. Weekly Field Activities Report (para 1.3.13). Transmit a Weekly field activities report during field activities pursuant to a format developed by the AFCEE RTC. (Seqence 4, para 6.1)

II. Site Location and Dates

Dew Line Sites and Cape Lisburne, date to be established.

III. Base Support The base will:

3.1 Provide the contractor with existing engineering plans, drawings, diagrams, aerial photographs, digitized map files, etc., to facilitate evaluation of IRP sites under investigation.

3.2 Arrange for personnel identification badges, vehicles passes, and/or entry permits with the contention the contractor will provide necessary information to the base personnel no less than four weeks before needed.

3.3 Provide the contractor with all previously approved documents which provide information on all IRP efforts conducted at Dew Line Sites and Cape Lisburne and will aid in the determination of the amount of field work and analyses which need to be conducted.

IV. Government Furnished Property

See above in section III.

V. Government Points of Contact:

5.1 MAJCOM Coordinator

Major James R. Williams III
AFCEE/ESRU
8001 Inner Circle DR STE 2
Brooks AFB TX 78235-5328
(210) 536-5243
DSN 240-5243
(210) 536-9026 FAX
DSN 240-9026

5.2 Restoration Team Chief

Mr. Michael F. McGhee
AFCEE/ESRU
8001 Inner Circle DR STE 2
Brooks AFB TX 78235-5328
(210) 536-5293
DSN 240-5293
(210) 536-9026 FAX
DSN 240-9026

5.3 Base Point of Contact (POC)

Mr. Jim Wolfe
11 CEOS/CEVR
21885 Second Street
Elmendorf AFB AK 99506-4420
(907) 552-4532
DSN 317-552-4532
(907) 552-1533 FAX
DSN 317-552-1533

5.4 Public Affairs Coordinator

Ms. Wende Wolf
11 CEOS/DEVR
21885 Second Street
Elmendorf AFB AK 99506-4420
(907) 552-4532
DSN 317-552-4532
(907) 552-1533 FAX
DSN 317-552-1533

VI. Deliverables

6.1 Attachment 1 of the Basic Contract

Sequence numbers 1 and 5 listed in attachment 1 to the basic contract apply to all orders. Guidance for preparing R&D Status Reports (sequence 1) is contained in the Handbook, section 4. In addition, the sequence numbers and dates listed below are applicable to this order:

Sequence No.	Para No.	Block 10 (freq.)	Block 11 (as of date)	Block 12 (date of 1st. submit.)	Block 13 (date of final report)	Block 14 (no. of copies)
3 (NETWORK ANALYSIS)	I.1.4.1a	QTRLY	12APR93	30APR93	a	4
4 (WORK PLAN)	I.1.4.1b	ONE/R	12APR93	30MAY93	30JULY93	b
4 (SAP)	I.1.1.4c	ONE/R	12APR93	30MAY93	30JULY93	b
4 (HSP)	I.1.4.1d	OTIME	12APR93	30MAY93	-	10
4 (COMM. REL PLAN)	I.1.1.4e	ONE/R	12APR93	30MAY93	31DEC93	b
16 (SPECIAL NOTIF.)	I.1.4.2	OTIME	c	c	-	3
9 (PRESNT. MATERIAL)	I.1.4.3	ASREQ	d	d	-	10
18 (MTG. RPTS)	I.1.4.4	ONE/R	e	e	-	5
3 (NEWSLETTER)	I.1.4.5	QTRLY	12APR93	30NOV93	a	f
3 (FACT SHEETS)	I.1.4.6	ASREQ	12APR93	15JUL93	g	-
3 (PUBLIC NOTICES)	I.1.4.7	ASREQ	12APR93	15JUL93	g	h
9 (PHOTO NOTEBOOK)	I.1.4.8	OTIME	12APR93	15JUL93	-	1
3 (MAILING LIST)	I.1.4.9	QTRLY	12APR93	15JUL93	a	-
3 (MAPS)	I.1.4.10	OTIME	12APR93	15JUL93	-	2
4 INFO REPOS	I.1.4.11	OTIME	31JUL93	-	31JAN94	2
3 (IRPMS Data ITIR) (Data Management)	I.1.4.12	OTIME	31JUL93	31JAN94	31MAR94	2
BCHCON						
BCHLDI						
BCHSLI						
BCHWCI						
BCHSAMP						
BCHCALC						
BCHLTD						
BCHTEST						
BCHRES						
BCHGWD						
4 DECISION DOC	I.1.4.13	ONE/R	i	i	31OCT94	b
4 RI REPORT	I.1.4.14.1	ONE/R	15SEP93	15FEB94	30APR94	b
4 RISK ASSESSMENT	I.1.4.14.2	ONE/R	1OCT93	16MAY94	15JUL94	b
4 FEASIB. STUDY	I.1.4.14.3	ONE/R	30SEPT93	30AUG94	-	b
4 RI/FS Report	I.1.4.14.4	ONE/R	30SEP93	30SEP94	1JAN95	b
4 IRP DOCUMENT	I.14.15	ONE/R	31JUL93	31OCT93	10DEC93	b
3 SCREENING ALTER ITIR	I.1.4.16a	OTIME	30SEP93	30DEC93	-	10
3 DETAL ANALYSIS ALTER ITIR	I..1.4.16.b	OTIME	28 FEB94	30MAR94	-	10
1 DPM SCORING	I.1.4.16c	OTIME	30SEP93	j	j	3
3 MYLAR MAP	I.1.4.16d	OTIME	k	k	-	5
3 GEOPHYS CONT	I.1.4.16.e	OTIME	l	l	-	10
3 SOIL GAS MAP	I.1.4.16f	OTIME	l	l	-	10
4 SCS ITIR	I.1.4.16g	ONE/R	15SEP93	30NOV93	15FEB94	5
4 WEEKLY ACT REP	I.1.4.16h	WEEKLY	13AUG93	13AUG93	-	1

6.2 Reserved.

6.3 Notes

a. Submit Quarterly Thereafter.

b. One (1) first draft plan (8 copies), one (1) second draft plan (8 copies), and one (1) final plan (10 copies) are required. Incorporate Air Force comments into the second draft and final plan as specified by the RTC. Supply AFCEE/ESR with an advance copy of the first draft, second draft, and

final plan for acceptance prior to distribution. Distribute the remaining copies of each plan as specified by the RTC. The second and final reports shall be submitted within three (3) weeks of receipt of comments from the RTC.

c. Primary and Secondary Documents. One first draft report (25 copies), one second draft report (25 copies), and one final report (35 bound copies plus the original camera-ready copy and a 3.5 inch disk formatted in WordPerfect 5.1 containing the document file) are required. Incorporate Air Force comments into the second draft and final reports as specified by the RTC. Supply the RTC with an advance copy of the first draft, second draft, and final reports for acceptance prior to distribution. Distribute the remaining copies as specified by the RTC .

d. Provide written notice with supporting documentation within three (3) days of telephone notification and at the direction of the RTC. Assume a maximum of 100 pages.

e. Provide within one (1) week of task/meeting completion.

f. Provide 500 copies of the Newsletters and distribute as agreed to by the RTC. This includes mailing the final product to on-base personnel and addresses on the existing mailing list.

g. Provide draft and final deliverables. Provide two advance copies to the AFCEE RTC and to the 11 CEOS Community Relations Coordinator for acceptance prior to preparation of the final deliverables.

h. Provide poster-size map.

i. Submit with the second draft Technical Report

j. Submit with the Technical Report

k. Provide with the Technical Report

l. Provide within four (4) weeks of task completion

ANNEX-A, TABLE A-1
SUMMARY OF ESTIMATED FIELD WORK FOR COST-ESTIMATING PURPOSES ONLY

Estimated Number of Monitor Wells to be Constructed	5
Estimated Footage of Monitor Wells	100
Estimated Number of Water Samples for Lab Analysis	339
Estimated Number of Surface and Subsurface Soil Sampling	1350
Estimated Number of Soil Samples from Augerings	1350
Estimated Number of Containerized Waste Samples	40
Estimated Number of Disposal Water Samples	5
Estimated Number of Sludge Samples	5
Estimated Number of Wipe Samples	3
Estimated Number of Geophysical Surveys	3
Estimated Total Number of Survey Days	20
Estimated Number of Soil Gas Survey Days	20

Annex-A, Table A-2
Analytical METHODS AND ESTIMATED TOTAL NUMBER OF SOIL ANALYSES
(for Cost Estimating Purposes Only)

	analytical method (a)	Reporting Units	Number of Analyses	Trip Blanks	Amb. Cond Blanks	Equipment Blanks	Dup/Rep	Second Column (b)	Total Analyses
Petroleum Hydrocarbon (Gasoline Range Organics)	SW3050/SW8015 (mod)	mg/Kg	400	20	20	20	40		500
Petroleum Hydrocarbon (Diesel Range Organics)	SW3050/SW8015 (mod)	mg/Kg	400			20	40	-	460
ICP Screen (23 Metals, exclude Boron and Silica)	SW3050/SW6010	mg/Kg	100	-	-	6	10	-	116
Arsenic	SW3050/SW7060	mg/Kg	-	-		-	-	-	0
Lead	SW3050/SW7421	mg/Kg	-	-	-	-	-	-	0
Mercury	SW7471	mg/Kg	-	-		-	-	-	0
Selenium	SW3050/SW7740	mg/Kg	-	-		-	-	-	0
Organochlorine Pesticides and PCBs	SW3540/SW8080	mg/Kg	500	-		20	50	250	820
Volatile Organic Compounds	SW8240	mg/Kg	72	8	8	4	7	36	135
Semivolatile Organic Compounds	SW3540/SW8270	mg/Kg	100	-		10	10	-	120
Polynuclear Aromatic Hydrocarbons	SW3540/SW8310	mg/Kg	-	-		-	-	-	0
Volatile Organic Compounds	SW5030/SW8010	mg/kg	-	-		-	-	-	0
Volatile Organic Compounds	SW5030/SW8020	mg/kg	-	-		-	-	-	0
Volatile Organic Compounds	SW5030/SW8260	mg/kg	-	-		-	-	-	0
Total Organic Compounds	SW5030/SW9060	mg/kg	88	-	-	-	4	8	100
Cyanide, Total	SW9010	mg/Kg	-	-		-		-	0
Toxic Characteristic Leaching Procedures (TCLP)	SW1311	mg/L	40	-	-	-	-	-	40
Soil Moisture Content	ASTM D2216	Percent (%)	650	-		-	-	-	650
Soil PH	SW9045		650	-		-	-	-	650
Sulfer Cleanup/Florisil Cleanup	SW3660/SW3620		-	-	-	-	-	-	0
Gel-Permeation Cleanup	SW3640		-	-	-	-	-	-	0
Total Analyses			3000	28	28	80	161	294	3591

Annex A, TABLE A-3
Analytical Methods and Estimated Total Number of Water Analyses
(For Cost Estimating Purposes Only)

	analytical method (a)	Reporting Units	Number of Analyses	Trip Blanks	Amb Cond Blanks	Equipment Blanks	Dup/Rep	Second Column(b)	Total Analyses
Alkalinity-Carbonate, Bicarbonate, & Hydroxide (field test)	A403	mg/L	10			-	1	-	11
Specific Conductance (field test)	E120.1	mg/L	10			-	1	-	11
pH (field test)	E150.1	µmhos/cm	15			-	2	-	17
Residue, Filterable (Total Dissoloved Solids)	E160.1	mg/L	80			3	8	-	91
Non-Filterable Residue (Total Suspended Solids)	E160.2	mg/L	80		-	-	8		88
Temperature (field test)	E170.1	deg C	200			-	-	-	200
Common Anions (Chloride, Fluoride, Sulfate)	E325.1	mg/L	-	-	-	-	-	-	0
Nitrogen, Nitrate+nitrite	E353.2	mg/L	-		-	-	-	-	0
ICP Screen (23 metals, exclude Boron and Silica)	SW3005/SW6010	mg/L	100		-	7	25	-	132
Arsenic	SW7060	mg/L	-		-	-	-	-	0
Lead	SW3005/SW7421	mg/L	100		-	2	10	-	112
Mercury	SW7470	mg/L	-		-	-	-	-	0
Selenium	SW7740	mg/L			-	-	-	-	0
Petroleum Hydrocarbons (Gasoline Range Organics)	SW5030/SW8015 (mod.)	mg/L	150	10	10	5	35	-	210
Petroleum Hydrocarbons (Diesel Range Organics)	SW5030/SW8015 (mod.)	mg/L	150			5	35	-	190
Purgeable Halocarbons	SW5030/SW8010	µg/L	150	8	8	4	25	75	270
Nonhalogenated Volatile Organics	SW5030/SW8015	µg/L	150	8	8	4	25	125	320
Purgeable Aromatics	SW5030/SW8020	µg/L	150	8	8	4	25	125	320
Organochlorine Pesticides and PCBs	SW3510/SW8080	µg/L	166	-	-	3	17	83	269
Semivolatile Organic Compounds	SW3510/SW8270	µg/L	150	-	-	4	15	-	169
Polynuclear Aromatic Hydrocarbons	SW3510/SW8310	µg/L	150		-	4	15	-	169
Volatile Organic Compounds	SW3510/SW8260	µg/L	-		-	-	-	-	0
Volatile Organic Compounds	SW3510/SW8240	µg/L	150	8	8	4	25	125	320
Total Organic Compounds	SW9060	µg/L	80			4	10		94
Total Petroleum Hydrocarbon (WTPH-HCID)	E418.1	mg/L	-	-	-	-	-	-	0
Sulfur Cleanup/Florisil Column Cleanup	SW3660/SW3620	-	-	-		-	-	-	0
Gel-Permeation Cleanup	SW3640	-	-	-	-	-	-	-	0
COLUMN TOTALS			2041	42	42	53	282	533	2993

Notes:

a Unless an abbreviated list of analytes is specified under "Parameter" above, the analytical protocol shall include all analytes listed in the referenced analytical method. The methods cited are from the following sources:

"A" Methods	Standard Methods for the Examination of Water and Wastewater, 16th Edition (1985)
"E" Methods	Methods for Chemical Analysis of Water and Wastes, EPA Manual, 600/4-79-020 (USEPA, 1983--with additions)
"SW" Methods	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition (USEPA, 1986)
"ASTM" Methods	American Society for Testing and Materials, 1919 Race treet, Philadelphia, PA 19103

b The maximum number of second-column confirmation analyses shall not exceed fifty (50) percent of the actual number of field samples (to include duplicates, replicates, ambient, condition blanks, trip blanks, and equipment blanks). If the number of samples requiring second-column confirmation exceeds this allowance, contact the HSD Technical Project Manager. The total number of samples listed in Tables A-4 and A-5 includes the allowance applicable to each GC method. IF GC/MS, or a combination of second-column GC and GC/MS, is used, the total cost of all such analyses for a particular parameter shall not exceed the funding allowed for positive confirmation using only second-column GC.

REF 68X 68X

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. PAGE 1 OF 2

2. PROC INSTRUMENT ID NO. (PIIN): F33615-90-D-4010
3. SPIIN: 002203
4. EFFECTIVE DATE: 94 FEB 15
5. REQUISITION/PURCHASE REQUEST PROJECT NO.: FY7624-94-08235
6. SCO/DMS RATING

7. ISSUED BY CODE FA8900

DEPARTMENT OF THE AIR FORCE
AIR FORCE MATERIAL COMMAND
HUMAN SYSTEMS CENTER/PK
8005 9TH STREET
BROOKS AFB, TX 78235-5353
Buyer: EDWIN CUSTODIO/PKVBA
Phone: (210)536-4493

8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) CODE S2404A

DCMAO, BALTIMORE
ATTN: CHESAPEAKE
200 TOWNSONTOWN BLVD, WEST
TOWNSON MD 21204-5299

9. CONTRACTOR NAME AND ADDRESS CODE 69148 FACILITY CODE

ICF TECHNOLOGY
9330 LEE HIGHWAY
FAIRFAX VA 22031-1207
COUNTY: FAIRFAX
PHONE: (703) 934-3000

MAILING ADDRESS:
ICF TECHNOLOGY, INC
ATTN: CYNTHIA L. FALCE
FOUR GATEWAY CENTER 12TH FL.
PITTSBURGH PA 15222

IF "I" FOR MULTIPLE FACILITIES SEE SECT "K"

ADVANCE COPY

10. SECURITY CLAS U

11. DISCOUNT FOR PROMPT PAYMENT
1 ST % DAYS
2 ND % DAYS
3 RD % DAYS
NET DAYS
OTHER IF "O" SEE SECT "E"

12. PURCHASE OFFICE POINT OF CONTACT: MVH/M6V/MVH

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

[illegible]

14. THIS BLOCK APPLIES ONLY TO MODIFICATION OF CONTRACTS

[ ] THIS CHANGE IS ISSUED PURSUANT TO ______ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVED NUMBERED CONTRACT/ORDER.

[ ] THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.

[ ] THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF ______ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.

[X] THIS MODIFICATION IS ISSUED PURSUANT TO FAR52.253-3, CHANGES-TIME&MATLS OR LABOR HRS (AUG87)

15. CONTRACT ADMINISTRATION DATA

A. KIND OF MOD	B. MOD ABST RECIPIENT ADP PT	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PO/CAO ON TRANSFER	F. GAINING PO/CAO ON TRANSFER	G. SVC/AGENCY USE
C			$			

16. ENTER ANY APPLICABLE CHANGES

A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1) TYPE (2) KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE	H. DATE SIGNED	I. SECURITY (1) CLAS (2) DATE OF DD 254

17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.)

SUBJECT: TIME EXTENSION AT NO INCREASE IN CEILING AMOUNT
PROJECT OFFICER: MICHAEL F. MCGHEE, AFCEE/ESR, BROOKS AFB, TX 78235-5328
FINANCE OFFICE: (SC1030) DFAS-COLUMBUS CENTER
ATTN:DFAS-CO/CHESAPEAKE DIV.
P.O.BOX 182264, COLUMBUS OHIO 43218-2264

18. [X] CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT [ ] CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN ______ COPIES TO ISSUING OFFICE

19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)
BY

20. NAME AND TITLE OF SIGNER (Type or print)

21. DATE SIGNED

22. UNITED STATES OF AMERICA (Signature of Contracting Officer)
BY Gary J Macdecy

23. NAME OF CONTRACTING OFFICER (Type or print): GARY J. MACDECY

24. DATE SIGNED: 94 FEB 17

AFMC FORM 702, JUL 92 REPLACES AFSC FORM 702, AUG 84 WHICH IS OBSOLETE

1. Pursuant to the "Changes" Clause of Section I of the basic contract. The performance period and the final delivery schedule are changed from 15 Feb 94 (performance period) and 1 Jan 95 (final delivery schedule date) to 31 Dec 94. The ceiling amount of this delivery order will not be affected by this modification. This modification was generated by request of the contractor with no increase to the ceiling amount. contractor's letter dated 10 Feb 94 is incorporated to this document by reference.

ADVANCE COPY

REF 68X

CONTRACTOR COPY

68X

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. PAGE 1 OF 4

2. PROC INSTRUMENT ID NO. (PIIN): F33615-90-D-4010

3. SPIIN: 002204

4. EFFECTIVE DATE: MAIL DATE

5. REQUISITION/PURCHASE REQUEST PROJECT NO.: FY7624-94-08663

6. BCC/DMS RATING

7. ISSUED BY CODE FA8900

DEPARTMENT OF THE AIR FORCE
AIR FORCE MATERIEL COMMAND
HUMAN SYSTEMS CENTER/PKVBC
8005 9TH STREET
BROOKS AFB TX 78235-5318
Buyer: BRENDA DILLARD, HSC/PKVBB
Phone: (210) 536-4503

8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) CODE S2404A

DCMAO BALTIMORE
ATTN: CHESAPEAKE
200 TOWSONTOWN BLVD, WEST
TOWSON MD 21204-5299

9. CONTRACTOR NAME AND ADDRESS CODE 69148 FACILITY CODE

ICF TECHNOLOGY
9330 LEE HIGHWAY
FAIRFAX VA 22031-1207

COUNTY: FAIRFAX
PHONE: (703) 934-3000

IF "Y" FOR MULTIPLE FACILITIES SEE SECT "K"

MAIL DATE

AUG 15 1994

10. SECURITY CLAS: U

11. DISCOUNT FOR PROMPT PAYMENT: NONE

1ST % DAYS
2ND % DAYS
3RD % DAYS
NET DAYS
OTHER IF "Y" SEE SECT "E"

12. PURCHASE OFFICE POINT OF CONTACT: MEC/M5E/MVT

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in block 17. The hour and date specified for receipt of Offers ☐ is extended ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods:

(a) By signing and returning _____ copies of this amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

14. THIS BLOCK APPLIES ONLY TO MODIFICATION OF CONTRACTS

☐ THIS CHANGE IS ISSUED PURSUANT TO _____ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVED NUMBERED CONTRACT/ORDER.

☐ THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.

☐ THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF _____ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.

☒ THIS MODIFICATION IS ISSUED PURSUANT TO FAR 52.243-3, CHANGES - TIME AND MATERIALS OR LABOR HOUI

15. CONTRACT ADMINISTRATION DATA

A. KIND OF MOD	B. MOD ABST RECIPIENT ADP PT	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PO/CAO ON TRANSFER	F. GAINING PO/CAO ON TRANSFER	G. SVC/AGENCY USE
C			$			

16. ENTER ANY APPLICABLE CHANGES

A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1) TYPE (2) KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE	H. DATE SIGNED	I. SECURITY (1) CLAS (2) DATE OF DD 254

17. REMARKS (*Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.*)

SUBJECT: REVISION TO STATEMENT OF WORK
PROJ MNGR: SAMER N. KARMI, AFCEE/ERDW, 8001 INNER CIRCLE, BROOKS AFB, TX
FINANCE OFFICE: (SC1030)DFAS COLUMBUS CENTER, ATTN: DFAS-CO/CHESAPEAKE DIV
PO BOX 182264, COLUMBUS OH 43218-2264

18. ☒ CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT ☐ CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN _____ COPIES TO ISSUING OFFICE

19. CONTRACTOR/OFFEROR (*Signature of person authorized to sign*)
BY

22. UNITED STATES OF AMERICA (*Signature of Contracting Officer*)
BY William M Watts

20. NAME AND TITLE OF SIGNER (*Type or print*)

21. DATE SIGNED

23. NAME OF CONTRACTING OFFICER (*Type or print*): WILLIAM M. WATTS

24. DATE SIGNED: 15 AUG 94

AFMC FORM 702, JUL 92 REPLACES AFSC FORM 702, AUG 84 WHICH IS OBSOLETE

1. Pursuant to the "Changes" Clause in Section I of the basic contract, the Statement of Work for Delivery Order 0022, dated 06 Jul 93 is superseded by the revised Statement of Work, dated 17 Jul 94. The subject delivery order ceiling amount is increased by $229,526.00.

2. As a result of paragraph 1 above, the said order is more specifically modified as set forth below:

a. SECTION A - Cover Page - The Not-to-Exceed amount in block 20 (cover page) is increased BY $229,526.00 from $3,299,352.00 to $3,528,878.00."

b. SECTION B - THE SCHEDULE

Item No	Supplies/Services		Quantity Purch Unit	Unit Price Total Item Amount
0001	CLIN Change	sec class: U	1 LO	N N

noun: SAMPLING, ANALYSIS AND DATA
acrn: XA nsn: N
site codes: pqa: D acp: D fob: D
pr/mipr data: FY7624-94-08202, FY7624-93-08305, FY7624-94-08353, FY7624-94-08235, and FY7624-94-08663
type contract: Y

descriptive data:
Conduct work in accordance with the Statement of Work (SOW) of this order, dated 17 JUL 94 and Section C, The Description/Specifications of the Basic contract. Submit data in accordance with Attachment #1, the Contract Data Requirements List (CDRL) of the basic contract as implemented by paragraph VI of this order's SOW. This modification adds $83,590.00 to the price for CLIN 0001.

Item No	Supplies/Services		Quantity Purch Unit	Unit Price Total Item Amount
0002	CLIN Change	sec class: U	1 LO	N N

noun: SAMPLING, ANALYSIS AND DATA
acrn: XA nsn: N
site codes: pqa: D acp: D fob: D
pr/mipr data: FY7624-94-08202, FY7624-93-08305, FY7624-94-08353, FY7624-94-08235, and FY7624-94-08663
type contract: Y

descriptive data:
Provide support in accordance with the Statement Work (SOW) of this order, dated 17 JUL 94 and Section C, The Description/Specification of the basic contract. This modification adds $128,148.00 to the price for CLIN 0002.

SECTION B - THE SCHEDULE (Cont'd)

Item No	Supplies/Services		Quantity Purch Unit	Unit Price Total Item Amount
0004	CLIN Change	sec class: U	1 LO	N N

noun: CHEMICAL ANALYSES
acrn: XA nsn: N
site codes: pqa: D acp: D fob: D
pr/mipr data: FY7624-94-08353, FY7624-94-08235, and
FY7624-94-08663
type contract: Y

descriptive data:
This modification adds $17,788.00 to the price
for CLIN 0004.

c. SECTION C - Description/Specs - The SOW for this order entitled "Installation Restoration Program Remedial Investigation/Feasibility Study, Distant Early Warning (DEW) Line Sites and Cape Lisburne AFS, AK", dated 17 Jul 94 is attached hereto as Attachment #1 to this modification.

d. SECTION F - Supplies Schedule Data - The delivery schedule is modified as set forth below:

Item No	Supplies Schedule Data		Delivery Quantity	Schedule Date
0001	CLIN Del Sch Change acrn: XA ship to: U	sec class: U	1	95APR01
0002	CLIN Del Sch Change acrn: XA ship to: U	sec class: U	1	95APR01
0004	CLIN Del Sch Establish acrn: XA ship to: U	sec class: U	1	95APR01

e. SECTION G - Accounting Classification Data:

ACRN	Acct Class data	Appropriation/Lmt Subhead/CPN Recip DODAAD Supplemental Accounting Classification		Obligation Amount
AC	ACCOUNT ESTABLISH UNCLASSIFIED	5743400 304 7431 434419 040000 53440 000000 674400	F74400	$229,526.00+

pr/mipr data:
FY7624-94-08663

XA SPECIAL ACRN CHANGE
UNCLASSIFIED

descriptive data:
Special ACRN XA funds CLINs 0001, 0002, and 0004 and includes the following:

AA:$ 299,855.00
AB:$ 99,986.00 (mod 0022,01)
:$2,899,511.00 (mod 0022,02)
AC:$ 229,526.00 (mod 0022-04)
TOTAL $3,528,878.00

FINANCE OFFICER: Pay funds in alphabetical order.

3. All other terms and conditions remain unchanged.

1994 JUL 17 ~~1993 JUL 6~~

STATEMENT OF WORK
INSTALLATION RESTORATION PROGRAM
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

~~STAGE 1~~

DISTANT EARLY WARNING (DEW) LINE SITES and CAPE LISBURNE AFS, AK

I. DESCRIPTION OF WORK

1.1 Scope

1.1.1 **Background.** The objective of the Air Force Installation Restoration Program (IRP) is to assess past hazardous waste disposal and spill sites on Air Force installations and develop remedial actions consistent with the National Contingency Plan (NCP) for those sites which pose a threat to human health and welfare or the environment. This objective is achieved through a Remedial Investigation Feasibility Study (RI/FS) process in which conclusions and recommendations drawn from accurate and validated data are used to structure and guide subsequent activities.

The RI/FS process includes scoping to define data requirements and objectives, a remedial investigation to characterize sites for a baseline risk assessment, and a feasibility study to define and evaluate alternative remedial actions so that a recommended action may be selected. Each of these steps of the RI/FS process can be conducted in stages that focus on particular aspects of the process.

The Contractor shall accomplish the actions described in this Statement of Work (SOW) to complete the RI/FS process at the following seven Dew Line Sites and Cape Lisburne:

Barter Island AFS (BAR-M); Bullen Point AFS (POW-3); Point Lonely AFS (POW-1); Point Barrow AFS (POW-M); Point Lay AFS (LIZ-2); Wainwright AFS (LIZ-3); and Oliktok Point AFS (POW-2).

1.1.2 **Requirements for Project Activities.** ~~The Installation Restoration Program (IRP) Handbook referenced in this Statement of Work provides requirements for laboratory and field activities and applicable formats for project documents that shall be used by the Contractor. Volume 1 of the Handbook dated May 1992 is provided under separate cover. This document is referenced in this Statement of Work as the Handbook.~~ The Handbook to Support the Installation Restoration Program (IRP) Statements of Work, dated September 1993, referred to in this SOW as "The Handbook," is provided under separate cover as general guidance only. Any reference within the Handbook language regarding compliance and/or formats for reports as a requirement of this Delivery Order shall be considered deleted. If a conflict is identified between this general guidance and any OSWER, U.S. Environmental Protection Agency (EPA), or other regulatory guidance or requirements, the Handbook shall be disregarded. Also, references to requirements for approval for deviations throughout the Handbook shall be considered invalid. Finally, the Method Detection Limits (MDLs) identified in the Handbook are a consolidation of numerous CFR documents which incorporate current EPA requirements. However, the Contractor shall be responsible for any updates in the CFR. The Contractor is responsible for the thorough knowledge and understanding of the previous findings and recommendations that affect this

task prior to the start of field activities. The documents involved include but are not limited to the IRP Phase I Records Search, and the IRP Phase II plans and reports addressing the Dew Line Sites and Cape Lisburne.

1.1.3 **Meetings.** ~~A maximum of two (2) Contractor personnel, including the project leader, shall attend eight (8) meetings at Elmendorf AFB, AK. Each meeting shall be two (2) 8-hour workdays in duration.~~ All meetings shall be coordinated by the Restoration Team Chief (RTC).

1.1.4 **Special Notifications.** The Contractor shall immediately report to the RTC via telephone, any data or results generated during this investigation which may indicate an imminent health risk. Following this telephone notification, a written notice shall be prepared and delivered within three (3) days. This notification shall include supporting documentation (sequence 16, para 6.1)

1.2 Project Scoping Documents

The purpose of the project scoping documents is to clearly and comprehensively define project activities prior to the initiation of field work. The Contractor shall prepare and submit the following project scoping documents for this task prior to the initiation of any field activities, removal actions, or laboratory analyses.

1.2.1 **Engineering Network Analysis.** Provide within ten (10) days after the issuance of an order a computer generated network analysis which is a detailed task plan for the RI/FS work efforts. The network analysis (GANTT) chart shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period of the delivery order. The network analysis (GANTT) shall show both serial and parallel subtasks leading to a deliverable product or report, and shall show early and late start and completion dates with float. The network analysis (GANTT) shall be updated and submitted quarterly (sequence 3, para 6.1).

1.2.2 **Work Plan.** This section will discuss the overall approach, (including a brief summary of the Conceptual Site Model and Data Quality Objectives), major tasks, scope, timeline, and major decision points. Due to the extreme remoteness of the Dew Line Sites and Cape Lisburne, the Contractor shall include a detailed plan for logistics and strategy to complete the RI/FS field activities. Follow the format specified in section 1 of the Handbook. In preparing the Work Plan, use previous reports and the information gathered during the literature search and presurvey along with experience at similar sites. Reevaluate the recommendations for Dew Line Sites and Cape Lisburne developed during previous IRP stages. The Contractor shall also prepare a draft and final addendum to the existing DEW Lines RI/FS work plan. The addendum shall detail the removal activities occurring at Cape Lisburne LRRS pursuant to paragraph I.1.3.14 of this SOW. (sequence 4, para 6.1).

1.2.3 **Sampling and Analysis Plan (SAP).** The SAP consists of a quality assurance plan (QAPP) and a Field Sampling Plan (FSP). Prepare a SAP describing how project activities will be accomplished in the format specified in section 1 of the Handbook. The Contractor shall also prepare a short addendum to this basic SAP which focuses on those sampling and analysis activities undertaken as part of the removal action specified in paragraph I.1.3.14 of this SOW. Incorporate review comments and obtain RTC concurrence prior to the start of field activities (sequence 4, para 6.1).

1.2.4 **Health and Safety Plan (HSP).** Provide a written Health and Safety Plan within eight (8) weeks after the issuance of an order. The Contractor shall also prepare an addendum to the existing DEW Lines RI/FS HSP, concerning removal activities conducted pursuant to paragraph I.1.3.14 of this SOW. The Contractor shall comply with USAF, OSHA, EPA, state, and local health and safety regulations regarding the proposed work effort. Use EPA guidelines for designating the appropriate levels of protection needed at the study sites. The Health and Safety Plan shall provide no less protection than the protection contained in the manual entitled "Health and Safety Requirements for Employees Engaged in Field Activities" dated 1981 and the "Occupational Safety and Health Manual for Hazardous Waste Sites Activities" dated 1985 and 29 CFR 1910. Coordinate the Health and Safety Plan directly with applicable regulatory agencies prior to submittal to AFCEE/ESR. The Contractor shall certify to AFCEE/ESR that the Contractor has reviewed the coordinated Health and Safety Plan with each employee and also subcontractor's employees prior to the time each employee engages in field activities (sequence 4, para 6.1).

1.2.5 **Community Relations Plan.** The Contractor shall prepare a Community Relations Plan (CRP) for the DEW Line Sites and Cape Lisburne AFS outlining the specific public communications and involvement techniques to be used in coordination with remedial site activities (sequence 4, para 6.1). Follow the guidance contained in "Community Relations in Superfund, a Handbook", office of Solid Waste and Emergency Response (OSWER) Directive 9230.0-03C (EPA/540/R-92/009, January 1992, PB92-963341), and other applicable directives. Also, use as a guidance previously accomplished CRP from other installations in Alaska. Appropriately adapt such guidance to the local situation at the DEW Line Sites and Cape Lisburne. As described in OSWER Directive 9230.0-03C, the CRP shall include, but not be limited to, a description of the sites and the community, an overview of the community involvement to date, key community concerns regarding the site and AF site activities, and suggested community relations activities. A contact list of elected officials, agency representatives, and interested groups and individuals shall be included in appropriate copies of the plan. In addition, the plan will include suggested locations for meetings and information repositories. Contractor activities to develop the CRP shall include conducting a review of site information provided by the AF.

1.3 **Project Activities**

The Contractor shall conduct the following tasks to achieve the purposes stated herein, in compliance with approved scoping documents, the Handbook, and all applicable regulations and requirements.

1.3.1 **Community Relations.** Provide support to the base public affairs office for the tasks described below pertaining to the RI/FS Community Relations Program.

1.3.1.1 Public meetings and workshops. The Contractor shall be responsible for coordinating public meetings and workshops for all DEW Line Sites and Cape Lisburne AFS. This includes producing briefing scripts, slides and any associated products such as response cards and sign-in sheets. As requested by the base Community Relations office in coordination with the RTC, research and provide materials for public queries, news media queries, and news releases. Assume a maximum of one (1) workshop/meeting (Seq. nos. 3,9).

1.3.1.2 Public notices. As required by the base Community Relations office and the RTC, the Contractor shall prepare and publish public notices for the Fairbanks and local newspapers. The purpose of these notices is to inform the public of a meeting, workshop, or comment period in which they have the opportunity to be involved in the IRP Program at DEW Line Sites and Cape Lisburne AFS. Also, these notices may be utilized to inform the public of other pertinent program information such as quarterly notices of documents placed in the information repositories. The format for the notices shall be coordinated with the Community Relations office and RTC, and then submitted to the RTC for review prior to delivery to the base. Assume a maximum of two (2) notices (Seq. no. 3).

1.3.1.3 Photo Notebook. The Contractor shall develop a photo notebook which focuses on the overall IRP program at DEW Line Sites and Cape Lisburne AFS. The layout of the notebook will be coordinated with the public affairs office and RTC. Assume a maximum of one (1) update (Seq. no. 9).

1.3.1.4 Mailing List. In coordination with the base Community Relations office and the RTC, prepare and update the mailing list on a quarterly basis. Assume a maximum of two (2) updates (Seq. no. 3).

1.3.1.5 Maps. Prepare presentation quality maps of the installations and their sites to use in newsletters and to distribute to the public.

1.3.1.6 Information Repository/Administrative Record. Prepare a listing of all documents required for the Information Repository and Administrative Record. Create an Information Repository and Administrative Record. The Repository and Record will be maintained by the 11 CEOS/CEVR Community Relations Coordinator. Assume two locations for the Repository and Record, one in Anchorage and another in Elmendorf AFB, AK. Actual locations will be determined by the 11 CEOS/CEVR Community Relations Coordinator.

1.3.2 **Literature Search.** Conduct a literature search and analyze aerial photos of the DEW Line Sties to supplement existing information that has been collected. The purpose of the literature search is to complete the conceptual site model so that a numerical estimate of risk can be developed.

1.3.3 **Presurvey.** Within eight weeks of the issuance of an order, the Contractor shall visit the Dew Line Sites and Cape Lisburne to ensure complete understanding of site conditions. Coordinate this visit with the RTC and the 11 CEOS project manager. The Contractor shall look for evidence of contamination at each site visited (e.g., leaking drums, vegetative stress, leachate seeps). The Contractor shall observe the physical settings of each site visited to formulate specific recommendations concerning boring placement, use of geophysical techniques, and other aspects of the proposed field investigation. The findings of the presurvey shall be used to prepare the Work Plan, SAP, and HSP for the RI and to prepare scoping documents for the treatability study(ies). Assume one presurvey and one reconnaissance trip.

1.3.4 **Quality Assurance/Quality Control (QA/QC).** A QA/QC program shall be conducted and documented for all work pursuant to this delivery order. Contractor and project-specific documents concerning QA/QC procedures and requirements shall be strictly followed. Data generated under the QA/QC program shall be used by the Contractor for evaluating the analytical results and field records assembled for each site to identify accurate and validated data that may be used to assess risk, develop conceptual site models and evaluate alternatives.

1.3.5 **Conceptual Site Model.** Use all available RI/FS data supported by acceptable QA/QC results (as measured against QAPP requirements) and site characterization information to refine, based on newly collected data, the conceptual site model. The model shall define the nature and extent of contamination and the transport and fate of those contaminants. The minimum requirements of the model are given in section 2 of the Handbook. The complexity and detail of the site model shall be consistent with the nature of the site and site problems, and the amount of data available the conceptual site model shall be documented in the Work Plan.

1.3.6 **ARARs Evaluation.** The Contractor shall identify all Applicable or Relevant and Appropriate Requirements (ARAR). These ARARs will be documented in the Work Plan.

1.3.7 **Data Collection, Sampling, and Analysis Procedures.** The Contractor shall conduct field activities, sampling, laboratory analysis, and data quality assessment. Section 2 of the Handbook is recommended for the Contractor to follow. The Contractor shall conduct all activities in accordance with the WP and the SAP approved by the COR. The COR shall be notified in writing of any planned deviation from the activities specified in these documents. COR approval of deviations is required prior to performance. The Contractor shall ensure that all analyses and analytical methods' QA/QC requirements are being met at all times before and during the analysis of samples.

The field investigation (including all drilling and sampling operations) shall be supervised by a registered geologist, hydrogeologist, or professional engineer. If required by the state, the on-site field supervisor shall be certified by the state to install test wells. A detailed log of field conditions, materials penetrated during drilling, well completion, and sampling conditions, as described in Section 2 of the Handbook, shall be maintained and made available for Government inspection upon request. Decisions on well and boring locations, well depths, screened intervals, and all details of the field investigation shall be made by the COR, and the Contractor's field or project supervisor.

1.3.8 **Regulatory Requirements and Permits.** All well drilling, development , sampling, laboratory analysis, and other activities pursuant to this effort shall be conducted in strict accordance with all applicable federal and state laws, ordinances, rules and regulations, and all authorities with jurisdiction over such activities. The Contractor shall complete permits, applications, other documents, and proficiency tests required by the regulatory agencies. The Contractor shall file documents with appropriate agencies and pay all applicable permit and filing fees. The Contractor shall identify locations requiring permits to Radar Station Manager. The Contractor shall include all correspondence in appendices to the technical reports in accordance with Section 4 of the Handbook.

All laboratory analyses shall conform to all applicable federal, state, and local regulatory agency requirements. If the requirements specify that certification is necessary to conduct one or more specific analyses, the Contractor shall furnish documentation showing laboratory certification with the first set of analytical data supplied to AFCEE/ESR and the COR.

The Contractor shall containerize and sample materials suspected to be hazardous in accordance with applicable requirements, Guidance from the Handbook, and the approved Plans. The Contractor shall transport these containerized materials to a location within the installation boundary designated by the Radar Station Manager at a frequency specified by the

Station Manager. The Contractor shall handle, store, and/or dispose of potentially hazardous materials. The Contractor shall transport and empty containerized materials determined not to be hazardous to locations within the installation boundary identified by the Station Manager.

1.3.9 **Remedial Investigation (RI).** The Contractor shall conduct a RI to characterize environmental conditions; define the concentration, nature, and extent of contamination; and quantitatively estimate the risk to human health and the environment and study the area through the collection of geologic and hydrologic data, environmental samples, the laboratory analyses of those samples for potential contaminants, the evaluation of the analytical results and field measurements with respect to quality control data, and the interpretation and analysis of accurate and precise data. The purpose of data collection, sample collection, and laboratory analysis is to determine whether any contaminants generated from installation activities have entered the environment. The field investigation is used to determine the source of any identified contaminants, the magnitude of contamination relative to Applicable or Relevant and Appropriate Requirements (ARARs), and any naturally occurring or background concentrations for specific compounds. The RI shall comply with the specifications, procedures, and methodologies presented in the project-specific SAP. The COR must be notified in writing prior to any modification of or deviation from any activity described in these documents.

1.3.9.1 **Soil Borehole Drilling and Sampling and Well Installation and Sampling.** The Contractor shall drill and collect samples from boreholes as specified in the SAP. The Contractor shall evaluate the need to install, sample, and develop monitoring or extraction wells.

1.3.9.1.1 **Lithologic Samples.** The Contractor shall describe core samples at least every five (5) feet of drilling or at each change in lithology, whichever is less, to indicate significant changes in lithology of characteristic properties that relate to the strata penetrated. Any deviations shall be coordinated with the COR. Guidance for standard identification practices are found in the Handbook. The Contractor shall include in the field logbook observations made by the driller and rig geologist during drilling such as depth to water, penetration rate, drill rig behavior, and other observations that might be indicative of changes in formation characteristics. The Contractor shall record depth to permafrost in all the soil borings and shall not proceed beyond five (5) feet into the permafrost layer.

1.3.9.1.2 **Drill Cuttings and Drilling Fluids.** The Contractor shall containerize all drill cuttings and drilling fluids. All drill cuttings and drilling fluids shall be managed and disposed of in accordance with the project SAP. (Note: The Contractor shall be responsible for providing all necessary containers.) The Contractor shall be responsible for the logistics of the ultimate disposal of all drill fluids or drill cuttings deemed hazardous in accordance with current EPA off-site disposal policy and state and/or local hazardous waste disposal laws. The contractor shall coordinate with the Station Manager for on-site placement and disposal of all drill cuttings, fluids, purge fluid, and excavated material. If on-site disposal is excluded, all hazardous waste shall be transported by a permitted hazardous waste transporter to a licensed Resource Conservation and Recovery Act (RCRA) approved facility and be accompanied by a Uniform Hazardous Waste Manifest. The Contractor shall provide a final, completed copy of the hazardous waste manifest to the 11 CEOS/CEVR. The Radar Stations' hazardous waste managers will sign all hazardous waste manifest documents.

1.3.9.1.3 **Well/Boring Precautions.** The Contractor shall mark the field locations of all borings during the planning/mobilization phase of the field investigation. The Contractor shall consult with base personnel to minimize the disruption of base activities, to properly position wells with respect to site locations, and to avoid penetrating underground utilities. The Contractor shall obtain all permits prior to commencement of digging and drilling operations. The Contractor shall utilize a registered land surveyor in determining the elevations and locations of all off-base background study borings. All borings and wells from which samples are taken shall be surveyed by the Contractor for vertical and horizontal control. The Contractor shall record the positions on project and site specific maps. Bench marks used must have been previously established from and be traceable to a U. S. Coast and Geodetic Survey (USCGS) or U. S. Geological Survey (USGS) survey marker. Clearly identify all bench mark locations on the base map.

1.3.9.1.4 **Water-Level Measurements in Boreholes.** The Contractor shall measure water levels in all boreholes after the water level has stabilized. Include this information and the date of measurement in the boring logs. Also, record soil moisture conditions (moist, wet, saturated, etc.) in the boring log.

1.3.9.1.5 **Air Monitoring During Drilling.** The Contractor shall monitor the ambient air in the breathing zone above the borehole during all drilling with an appropriate organic vapor analyzer to identify potentially hazardous and/or toxic vapors. Include air monitoring results in borehole logs.

1.3.9.1.6 **Subsurface Soil Sampling.** The Contractor shall collect soil samples from borings as specified in the SAP. The SAP specifies the analytical methods, the parameters for analysis, and the estimated number of analyses for soil samples.

1.3.9.1.7 **Well Construction Requirements.** The Contractor shall coordinate with the COR to determine well completion requirements (flush or projected above ground surface). All wells shall be secured as soon as possible after drilling. The Contractor shall provide corrosion resistant locks for both flush and above-ground well assemblies. The locks shall be compatible with existing wells. The Contractor shall turn the lock keys over to 11 CEOS/CEVR POC following completion of the field effort. The Contractor shall coordinate with the 11 CEOS/CEVR POC, the RTC, and the COR the selection of exact well and screen placement, gravel pack design, and screen slot size.

1.3.9.1.8 **Well Logs.** For each well, the Contractor shall prepare a well completion log and schematic diagram showing well construction details. Lithologic descriptions, well elevation survey data, and other information included in the well logs shall conform to the specifications of the SAP.

1.3.9.1.9 **Well Development.** The contractor shall develop each well as soon as possible. Guidance for well development procedures are found in the Handbook. The Contractor shall measure the rate of water production, pH, specific conductance, and water temperature during well development.

1.3.9.1.10 **Well Placement.** The Contractor shall avoid installing wells in depressions or areas subject to frequent flooding and/or standing water. If wells must be installed in such areas, the Contractor shall design the wells so standing water does not leak into the top of the casing or cascade down the annular space.

1.3.9.1.11 **Well and Borehole Clean-up.** The Contractor shall clean the area following the completion of each well and borehole. The Contractor shall return all sites to the original condition of the site.

1.3.9.1.12 **Groundwater and Surface Water Sampling.** The Contractor shall collect groundwater and Surface Water samples from newly developed well and existing wells and from surface water bodies. The SAP shall specify the analytical methods, the parameters for analysis, and the estimated number of analyses for groundwater and surface water samples.

1.3.9.1.13 **Composite Sampling.** The Contractor shall collect and analyze drill cuttings, fluids, purge fluids, and excavated material. The SAP shall specify the analytical methods, the parameters for analysis, and the estimated number of analyses for composite samples.

1.3.9.2 **Geophysical Surveys.** The Contractor shall evaluate whether geophysical surveys are needed (e.g., to determine boundaries of landfills, to locate underground debris, utilities and storage tanks). Where geophysical surveys are appropriate, the Contractor shall select a geophysical survey technique or techniques [such as ground penetrating radar (GPR), magnetometer or electromagnetic surveys (EM)] that will best meet the desired application. The technique(s) used shall be approved by the RTC prior to use. Approximate number of surveying days is included in Annex A which is to be used for costing purposes only. Appropriate grid systems shall be established and the Contractor shall use the results of this survey to prepare a contour map of the results. Provide this map as an attachment to the first R&D Status Report submitted after the completion of the geophysical surveys. The Contractor shall perform the geophysical surveys before drilling and use the results in selecting the location of soil borings, wells, test pits, if necessary.

1.3.9.3 **Permeability Testing.** The Contractor shall determine the need for a permeability test at Cape Lisburne AFS, to provide additional data on the hydrogeologic characteristics of the water table aquifer. The SAP shall specify the method to be used for the permeability test.

1.3.9.4 **Water Level Measurement.** The Contractor shall evaluate the need for conducting a complete round of water level measurements in all existing and new wells at Cape Lisburne AFS at the beginning of field work and during the field sampling effort. Data gathered shall be used for interpreting groundwater flow directions and groundwater gradient.

1.3.9.5 **Soil Gas Surveys.** The Contractor shall evaluate the need for soil gas surveys and Hydropunch (e.g., to select soil boring locations). If soil gas surveys and hydropunch are included as part of the approved Work Plan and FSP, the Contractor shall establish appropriate grid systems. The Contractor shall prepare a posting map of soil gas values relative to their location on the grid used. Provide this map as an attachment to the first R&D Status Report submitted after completion of the soil gas survey (sequence 3, para 6.1). Approximate number of surveying days are included in Annex A which is to be used for costing purposes only.

1.3.9.6 **Groundwater Field Screening.** The Contractor shall perform groundwater field screening. The SAP shall specify the method, location, and type of groundwater field screening.

1.3.9.7 **Baseline Risk Assessment.** The Contractor shall use data supported by acceptable QA/QC results (as measured against QAPP requirements) and the conceptual site model to numerically estimate the risk posed by site contaminants to human health and the environment. The Contractor shall identify and list all ARARs for those contaminants detected in environmental

samples at the site. The Contractor shall provide all ARARs evaluations as an attachment to the Technical Report. Provide the results of the baseline risk assessment in the Technical Report using the formats in Section 4 of the Handbook as a guidance.

The Contractor shall identify those sites posing minimal or no threat to human health, welfare, or the environment and for which no further action is appropriate.

The Contractor shall use the results of the risk assessment in establishing remedial action objectives and developing remedial alternatives in the Feasibility Study.

1.3.9.8 **Defense Priority Model Scores.** The Contractor shall use the Defense Priority Model to score the sites. The score shall be included as an appendix to the RI/FS Technical Report.

1.3.9.9 **Fate and Transport.** The Contractor shall perform fate and transport modeling for contaminants of interest to include the projection of future contaminant concentrations within the boundaries of the site. This will be done in conjunction with the RI/FS report.

1.3.10 **Feasibility Study (FS).** The Contractor shall perform a FS concurrently with the RI. As much of the FS as possible shall be performed early in the RI/FS process and refined as additional RI data are obtained. The Contractor shall use the information from the RI and the baseline risk assessment to develop and evaluate remedial action alternatives for each site where a threat to human health or the environment exists. The Contractor shall follow the procedures specified in USEPA OSWER Directive 9355.3-01, "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA." The Contractor shall employ streamlining methods wherever possible and develop and evaluate the minimum number of alternatives needed to provide a range of promising treatment and containment actions. The Contractor shall eliminate impracticable alternatives from further consideration early in the FS process. The scope and level of detail shall be consistent with the nature and complexity of site problems.

1.3.10.1 **Develop and Screen Alternatives.** The Contractor shall establish remedial action objectives and remediation goals for protecting human health and the environment. These objectives and goals shall be determined based on identified ARARs and acceptable exposure levels as defined in the baseline risk assessment and refined throughout the RI/FS process. Identify general response actions and applicable technologies based on site and contaminant conditions, and combine technologies to formulate distinct alternatives. The Contractor shall develop alternatives which eliminate, control, and /or reduce risk to human health or the environment to acceptable levels for each pathway. Where a wide variety of promising alternatives exists, the Contractor shall screen the alternatives based on effectiveness, implementability, and cost. The Contractor shall detail the development and screening of the alternatives process and identify the alternatives selected for detailed analysis in the Informal Technical Information Report (ITIR).

1.3.10.2 **Detailed Screening of Alternatives.** The Contractor shall conduct a detailed analysis on each alternative selected and identified in the above step and approved by the COR. Using the methodology in OSWER Directive 9355.3-01, the Contractor shall evaluate each alternative against the nine criteria. In addition to the individual assessment, the Contractor shall perform a comparative analysis to determine the relative performance of alternatives. The Contractor shall focus the analysis on sub-factors and criteria most pertinent to each site and the scope and complexity of the

proposed action. Provide a summary of the Detailed Analysis of Alternatives in the R&D report submitted following task completion. Include summary tables of the individual and comparative analyses that will be used in the Technical Report.

1.3.11 **Decision Documents.** The Contractor shall prepare and submit Decision Documents (DD) following the Handbook Section 4.4 as guidance. The purpose of the DD is to support a remedial action alternative or a no further action alternative. The Contractor shall submit an Interim Decision Document detailing the removal action process, results and conclusions.

1.3.12 **Site Specific Requirements.** The Contractor shall perform the requirements listed in this SOW in conformance with the guidance of the Handbook, requirements of the approved WP, and the SAP. Annex A specifies the proposed values for field and laboratory activities to be conducted, specifications for field activities, information for sediment and soil samples, analytical methods, parameters for analysis, estimated number of analyses for water/sediment/soil samples, required analytical methods, estimated number of analyses for all core samples, estimated number soil gas analyses for each parameter, and field QC sample requirements for soil and water samples for costing purposes only.

1.3.13 **Weekly Field Activity Report**

The contractor shall transmit a Weekly field activity report. The reports shall include, but not be limited to, all field work detailed in this SOW, a listing of any problems encountered (e.g., equipment problems, equipment downtime), and actions taken to resolve those problems. ~~The AFCEE RTC shall develop the format for the report.~~

1.3.14 **Removal Actions**

The Contractor shall complete the following tasks to remove or otherwise control source contamination and further characterize site conditions at Cape Lisburne LRRS. The Contractor shall include any data generated during these activities in the pertinent reports.

1.3.14.1 **Task 1** involves placement of an interceptor trench (French drain) below Petroleum, Oil, and Lubricant (POL) Tanks 1 and 2 to capture spilled or leaked petroleum products which are currently migrating through the subsurface toward a nearby surface water body. Collected material shall drain to a sump for separation into its water and petroleum components. Accumulated water shall be treated using granulated activated carbon or appropriate vapor control technology, chemically analyzed for the presence of remaining contaminants, and subsequently, in coordination with Alaska Department of Environmental Conservation (ADEC), disposed of according to all applicable water regulations. Recovered petroleum product will be incinerated on-site, after coordination ADEC. Soils excavated to accommodate the trench may be returned to the surrounding land, provided that they are not considered hazardous under the RCRA "contained-in" policy. Soils which are deemed hazardous may be drummed and sent for off-site disposal according to applicable hazardous waste regulations, or may be stored on-site pending subsequent remedial activities.

1.3.14.2 **Task 2** requires the removal and off-site disposal of a sludge pile located at Landfill and Waste Accumulation Area Number 1. Using a backhoe provided by the base, the sludge pile shall be excavated,

containerized in 55-gallon drums, and transported to a disposal facility in the continental U.S. A temporary drum staging area shall be established nearby to store the drums until they are transported. Current plans may involve shipment of waste on the barge's return trip to Cape Lisburne. Prior to field operations on this task, a representative sample of the sludge must be collected and analyzed using TCLP and other characteristic methods to determine if the material is a hazardous waste. The sludge must be managed and disposed of according to the results of such analyses. After removal of the sludge, the excavated area must also be sampled and analyzed to detect any constituents remaining at the site.

1.3.14.3 **Task** 3 involves limited PCB sampling and analysis. The purpose of this task is twofold: to further characterize contamination in ocean sediments adjacent to Landfill and Waste Accumulation Area Number 1, and to locate a reported "hot spot" undiscovered during the 1993 RI/FS sampling program.

1.4 Project Deliverables

Deliver the following documents in compliance with the requirements of item VI, the formats required in section 1 and 4 of the Handbook, and the specifications noted below. Draft reports are considered "drafts" only because they have not been reviewed and approved by the Air Force. In all other respects, "drafts" shall be complete, in the proper format, fully illustrated, and free of grammatical and typographical errors.

1.4.1 Scoping Documents.

a. Engineering Network Analysis (GANTT) (para 1.2.1). Provide within ten (10) days after the issuance of an order. Update and submit quarterly (sequence 3, para 6.1).

b. Work Plan (para 1.2.2). Use the format in section 1 of the Handbook (sequence 4, para 6.1).

c. Sampling and Analysis Plan (1.2.3). Use the format in section 1 of the Handbook (sequence 4, para 6.1).

d. Health and Safety Plan (para 1.2.4). Provide within six (6) weeks after the issuance of an order (sequence 4, para 6.1).

e. Community Relations Plan (para 1.2.5). Provide within eight (8) weeks after issuance of an order (sequence 4, para 6.1).

1.4.2 **Special Notification.** Provide written notification of imminent health hazards and supporting documentation within three (3) days of telephone notification (sequence 16, para 6.1).

1.4.3 **Presentation Materials.** The Contractor shall prepare and present up to two (2) presentation packages at meetings coordinated by the Air Force (sequence 9, para 6.1). Attendance of these meetings is included in paragraph 1.1.3 of this SOW. As part of the presentation materials, the Contractor shall provide paper copies of all slides and overheads.

1.4.4 **Meeting Summaries** (para 1.1.3). Provide no later than five (5) days after conclusion of each meeting (sequence 18, para 6.1).

1.4.5 **Newsletter.** Prepare and submit a quarterly newsletter which presents the status of the entire base IRP Program. This will include preparing an outline resulting from input by all Contractors involved in the program. The outline must be approved by the base and RTC prior to submittal of the newsletter. The final product will be printed and distributed as agreed to by the RTC. Assume a maximum of two (2) newsletters (Sequence no. 3).

1.4.6 **Fact Sheets.** As required by the base IRP Program, prepare and submit fact sheets which facilitate the public's understanding of the IRP Program. These sheets should include key community concerns regarding sites as specified by the base. Use the format agreed to by the base and RTC. Print and distribute the fact sheets as agreed to by the RTC. Assume a maximum of two (2) fact sheets (Sequence no. 3).

1.4.7 **Public Notices.** In accordance with paragraph 1.3.6.2, prepare and submit public notices for the Fairbanks and local newspapers. Use the format agreed to by the base and RTC (Sequence no. 3).

1.4.8 **Photo Notebook.** In accordance with paragraph 1.3.6.3, develop a photo notebook which focuses on the overall base IRP Program. The Contractor shall include photos of sites under investigation, field and removal activities, and sample locations. Photos shall reflect proper sampling techniques, QA/QC procedures, and Health and Safety reports during field activities. Prior to implementation, submit a conceptual layout of the notebook for review by the base and RTC (Sequence no. 9).

1.4.9 **Mailing List.** In accordance with the base Community Relations coordinator and paragraph 1.3.6.4, update the existing mailing list on a quarterly basis (Sequence no. 3).

1.4.10 **Maps.** In accordance with the base community Relations coordinator and paragraph 1.3.6.5, prepare presentation quality maps.

1.4.11 **Information Repository/Administrative Records.** Submit the Information Repository and Administrative Records in accordance with Air Force Guidance and in concurrence with the COR and the base Community Relations Coordinator. (sequence no. 4, para 6.1)

1.4.12 **Data Management.** The Contractor shall meet the data deliverable requirements of the Installation Restoration Program Information Management System (IRPIMS). The Contractor shall be responsible for recording field and laboratory data into a computerized format as required by the most current version of the IRPIMS Data Loading Handbook (mailed under separate cover). In order to perform this task, the Contractor shall use the IRPIMS Quality Control Tool (QC Tool) and PC software utility (mailed under separate cover with software manual) to quality check ASCII data files and to check all data files for compliance with requirements in the IRPIMS Data Loading Handbook. Upon request, the IRPIMS Contractor Data Loading Tool (CDLT) is available. This PC software is designed to assist the Contractor in preparing the various ASCII data files.

Individual IRPIMS data files (e.g., analytical results, groundwater level data, etc.), including resubmissions, shall be delivered with a transmittal letter by the Contractor to the Air Force Center for Environmental Excellence (AFCEE) in sequence according to a controlled time schedule as identified in the current version of the IRPIMS Data Loading Handbook. The Contractor shall include a copy of the Quality Control Tool error report, i.e., output from the QC tool, for each IRPIMS file submission. The error report shall be

submitted both in hard copy and as an electronic file on the submission disks with the filename of the error report identified in the transmittal letter (SEQUENCE No. 3).

All Contractor data deliverables shall be sent to:

AFCEE/ESD BLDG 624W
ENVIRONMENTAL RESTORATION DIVISION
ATTN: IRPIMS Data Management
Brooks AFB, TX 78235-5000

In addition, the Contractor shall provide a copy of the transmittal letter to the Air Force contracting office responsible for the contract, HSC/PKV (Brooks AFB, TX, 78235-5000) for AFCEE contracts. This letter shall identify the files included or otherwise omitted (with an appropriate explanation), the Government contract and delivery order number, and the Air Force POC that is responsible for monitoring the Government contract.

The Contractor shall be responsible for the accuracy and completeness of all data submitted. All data entered into the IRPIMS data files and submitted by the Contractor shall correspond exactly with the data contained in the original laboratory reports and other documents associated with sampling and laboratory contractual tasks.

Each file delivered by the Contractor will be electronically evaluated by AFCEE/ESD for format compliance and data integrity in order to verify acceptance. All files delivered by the Contractor are required to be error-free and in compliance with the IRPIMS Data Loading Handbook. Any errors identified by AFCEE/ESD in the submission shall be corrected by the Contractor.

1.4.13 **Decision Document.** The Contractor shall prepare and submit DD as described in Section 1.3.11 (SEQUENCE No. 4, para 6.1).

1.4.14 **Technical Reports**. Summarize the findings of the tasks pursuant to the SOW, integrate them with the results of all pertinent previous studies, and formulate conclusions and recommendations for future efforts in Technical Reports.

1.4.14.1. **Remedial Investigation (RI) Report** (para 1.3.3). Provide a RI Report following the format in section 4 of the Handbook (sequence 4, para 6.1).

1.4.14.2. **Risk Assessment (RA) Report** (para 1.3.3.7). Provide a RA Report following the format in section 4 of the Handbook (sequence 4, para 6.1).

1.4.14.3 **Feasibility Study Report** (para 1.3.4). Provide a Feasibility Study Report following the format in section 4.0 of the Handbook. (sequence 4, para 6.1).

1.4.14.4 **RI/FS Technical Report** (para 1.3.3). Provide a RI/FS Technical Report following the format in section 4.0 of the Handbook. The RI/FS Technical Report shall integrate the RI, RA, and FS reports. Provide two microfiche copies with the final RI/FS Technical Report (sequence 4, para 6.1).

1.4.15 **Basewide Comprehensive IRP Document.** The Contractor shall develop a comprehensive document that summarizes both the historic and projected IRP activities. This document shall be used as management tool to efficiently guide future IRP activities at the DEW Line Sites and Cape Lisburne AFS. The Contractor shall follow the outline developed by the AFCEE RTC. Assume two (2) updates (sequence no. 4)

1.4.16 **Analytical Data ITIR.** Prepare and submit the following ITIRs, as well as the Analytical Data ITIR itself:

a. Development & Screening of Alternatives (para. 1.3.10.1). Submit the results of the development and screening of alternatives in an ITIR prepared in compliance with section 3 of the Handbook (sequence 3, para 6.1)

b. Detailed Screening of Alternatives (para 1.3.10.2).

c. DPM Scoring (para 1.3.9.8). Provide scores, a summary of procedures and assumptions, and Automated DPM output tables for all sites scored with DPM (sequence 3, para 6.1).

d. Mylar[R] Map. Construct Radar Stations' maps of Mylar using guidelines in section 3 of the Handbook. The Maps shall contain all sites and related water and sediment sampling locations (sequence no. 3, para. 6.1). The Contractor shall create and update digitized map files. Use the digitized data file to produce the Mylar map. The Contractor shall print the revision date on the Mylar maps and the date shall be encoded in the digitized data file. Provide a copy of the revised digitized data file to AFCEE-ESO/ER (sequence 1, para. 6.2).

e. Geophysical Survey Contour Map (para 1.3.9.2). Provide a contour map showing geophysical survey results. Interpret the significance of the data in the R&D Status Report (sequence 3, para 6.1).

f. Soil Gas Map (para 1.3.9.5). Provide site maps showing soil gas data superimposed on the sampling locations and incorporate soil gas data generated by the 11 CEOS/CEOR. Interpret the significance of the data in the R&D Status Report (sequence 3, para 6.1).

g. Site Characterization Summary Informal Technical Information Report (SCS ITIR). The Contractor shall prepare the report to include the following components:

1. Source identification and contaminant delineation.

2. Identification and ranking of appropriate treatability studies for the listed sites.

3. Data and interpretations integrating the findings of the current study and all previous RI efforts at the sites.

4. Current isoconcentration plots of contaminants detected at each site, lithologic logs of each boring showing contaminants detected and relationship to other borings in the site, and cross-sections of the site showing contaminant distribution.

5. The contents and objectives of a Site Characterization Summary Informal Technical Information Report (ITIR) are specified in the Handbook. The Site Characterization Summary ITIR shall serve as a core document for the RI report. The Contractor shall submit an annotated outline of each section of the

ITIR for approval by the TPM prior to preparation of the report itself. The Contractor shall prepare the report as specified in the accepted annotated outline. The Contractor shall submit newly revised portions of the working draft ITIR in order to make available current site characterization data. A prime objective shall be to minimize the volume of comments on the working draft and final submittals by incorporating comments into the report in an on-going manner. The final summary shall contain all sites included in this effort (Sequence No. 4).

h. Weekly Field Activities Report (para 1.3.13). Transmit a Weekly field activities report during field activities pursuant to a format developed by the AFCEE RTC. (Sequence no. 4, para 6.1)

II. Site Location and Dates

Dew Line Sites and Cape Lisburne, date to be established.

III. Base Support The base will:

3.1 Provide the Contractor with existing engineering plans, drawings, diagrams, aerial photographs, digitized map files, etc., to facilitate evaluation of IRP sites under investigation.

3.2 Arrange for personnel identification badges, vehicles passes, and/or entry permits with the contention the Contractor will provide necessary information to the base personnel no less than four weeks before needed.

3.3 Provide the Contractor with all previously approved documents which provide information on all IRP efforts conducted at Dew Line Sites and Cape Lisburne and will aid in the determination of the amount of field work and analyses which need to be conducted.

IV. Government Furnished Property

Not Applicable

V. **Government Points of Contact:**

~~**5.1 MAJCOM Coordinator**~~

~~Major James R. Williams III~~
~~AFCEE/ERD~~
~~8001 Inner Circle DR STE 2~~
~~Brooks AFB TX 78235-5328~~
~~(210) 536-5243~~
~~DSN 240-5243~~
~~(210) 536-9026 FAX~~
~~DSN 240-9026~~

~~**5.2 Restoration Team Chief**~~

~~Mr. Michael F. McGhee~~
~~AFCEE/ERD~~
~~8001 Inner Circle DR STE 2~~
~~Brooks AFB TX 78235-5328~~
~~(210) 536-5293~~
~~DSN 240-5293~~
~~(210) 536-9026 FAX~~
~~DSN 240-9026~~

~~**5.3 Base Point of Contact (POC)**~~

~~Mr. Jim Wolfe~~
~~11 CEOS/CEVR~~
~~21885 Second Street~~
~~Elmendorf AFB AK 99506-4420~~
~~(907) 552-4532~~
~~DSN 317-552-4532~~
~~(907) 552-1533 FAX~~
~~DSN 317-552-1533~~

~~**5.4 Public Affairs Coordinator**~~

~~Ms. Wende Wolf~~
~~11 CEOS/DEVR~~
~~21885 Second Street~~
~~Elmendorf AFB AK 99506-4420~~
~~(907) 552-4532~~
~~DSN 317-552-4532~~
~~(907) 552-1533 FAX~~
~~DSN 317-552-1533~~

VI. Deliverables

6.1 Attachment 1 of the Basic Contract

Sequence numbers 1 and 5 listed in attachment 1 to the basic contract apply to all orders. Guidance for preparing R&D Status Reports (sequence 1) is contained in the Handbook, section 4. In addition, the sequence numbers and dates listed below are applicable to this order:

Sequence No.	Para No.	Block 10 (freq.)	Block 11 (as of date)	Block 12 (date of 1st. submit.)	Block 13 (date of final report)	Block 14 (no. of copies)
3 (NETWORK ANALYSIS)	1.1.4.1a	QTRLY	12APR93	30APR93	a	4
4 (WORK PLAN)	1.1.4.1b	ONE/R	12APR93	30MAY93	30JULY93	b
4 (WORK PLAN ADDENDUM)	1.1.4.1b	ONE/R		2WKSDOA	15SEPT94	m
4 (SAP)	1.1.1.4c	ONE/R	12APR93	30MAY93	30JULY93	b
4 (SAP ADDENDUM)	1.1.4.1c	ONE/R		3WKSDOA	15SEPT94	n
4 (HSP)	1.1.4.1d	OTIME	12APR93	30MAY93	-	10
4 (HSP ADDENDUM)	1.1.4.1d	OTIME		2WKSDOA		5
4 (COMM. REL. PLAN)	1.1.1.4e	ONE/R	12APR93	30MAY93	31DEC93	b
16 (SPECIAL NOTIF.)	1.1.4.2	OTIME	c	c	-	3
9 (PRESNT. MATERIAL)	1.1.4.3	ASREQ	d	d	-	10
18 (MTG. RPTS)	1.1.4.4	ONE/R	e	e	-	5
3 (NEWSLETTER)	1.1.4.5	QTRLY	12APR93	30NOV93	a	f
3 (FACT SHEETS)	1.1.4.6	ASREQ	12APR93	15JUL93	g	-
3 (PUBLIC NOTICES)	1.1.4.7	ASREQ	12APR93	15JUL93	g	h
9 (PHOTO NOTEBOOK)	1.1.4.8	OTIME	12APR93	15JUL93	-	1
3 (MAILING LIST)	1.1.4.9	QTRLY	12APR93	15JUL93	a	-
3 (MAPS)	1.1.4.10	OTIME	12APR93	15JUL93	-	2
4 INFO REPOS	1.1.4.11	OTIME	31JUL93	-	31JAN94	2
3 (IRPMS Data ITIR) (Data Management)	1.1.4.12	OTIME	31JUL93	31JAN94	31MAR94	2
BCHCON						
BCHLDI						
BCHSLI						
BCHWCI						
BCHSAMP						
BCHCALC						
BCHLTD						
BCHTEST						
BCHRES						
BCHGWD						
4 DECISION DOC	1.1.4.13	ONE/R	i	i	31OCT94	b
4 RI REPORT	1.1.4.14.1	ONE/R	15SEP93	15FEB94	30APR94	b
4 RISK ASSESSMENT	1.1.4.14.2	ONE/R	1OCT93	16MAY94	15JUL94	b
4 FEASIB. STUDY	1.1.4.14.3	ONE/R	30SEPT93	30AUG94	-	b
4 RI/FS Report	1.1.4.14.4	ONE/R	30SEP93	30SEP94	1JAN95	b
4 IRP DOCUMENT	1.14.15	ONE/R	31JUL93	31OCT93	10DEC93	b
3 ANALYTICAL DATA ITIR		OTIME		01DEC94		2
3 SCREENING ALTER ITIR	1.1.4.16a	OTIME	30SEP93	30DEC93	-	10
3 DETAL ANALYSIS ALTER ITIR	1..1.4.16.b	OTIME	28 FEB94	30MAR94	-	10
1 DPM SCORING	1.1.4.16c	OTIME	30SEP93	j	j	3
3 MYLAR MAP	1.1.4.16d	OTIME	k	k	-	5
3 GEOPHYS CONT	1.1.4.16.e	OTIME	l	l	-	10
3 SOIL GAS MAP	1.1.4.16f	OTIME	l	l	-	10
4 SCS ITIR	1.1.4.16g	ONE/R	-	01FEB95	01APR95	o
~~4 SCS ITIR~~	~~1.1.4.16g~~	~~ONE/R~~	~~15SEP93~~	~~30NOV93~~	~~15FEB94~~	5
4 WEEKLY ACT REP	1.1.4.16h	WEEKLY	13AUG93	13AUG93	-	1

6.2 Reserved.

6.3 Notes

a. Submit Quarterly Thereafter.

b. One (1) first draft plan (8 copies), one (1) second draft plan (8 copies), and one (1) final plan (10 copies) are required. Incorporate Air Force comments into the second draft and final plan as specified by the RTC. Supply AFCEE/ESR with an advance copy of the first draft, second draft, and final plan for acceptance prior to distribution. Distribute the remaining copies of each plan as specified by the RTC. The second and final reports shall be submitted within three (3) weeks of receipt of comments from the RTC.

c. Primary and Secondary Documents. One first draft report (25 copies), one second draft report (25 copies), and one final report (35 bound copies plus the original camera-ready copy and a 3.5 inch disk formatted in WordPerfect 5.1 containing the document file) are required. Incorporate Air Force comments into the second draft and final reports as specified by the RTC. Supply the RTC with an advance copy of the first draft, second draft, and final reports for acceptance prior to distribution. Distribute the remaining copies as specified by the RTC .

d. Provide written notice with supporting documentation within three (3) days of telephone notification and at the direction of the RTC. Assume a maximum of 100 pages.

e. Provide within one (1) week of task/meeting completion.

f. Provide 500 copies of the Newsletters and distribute as agreed to by the RTC. This includes mailing the final product to on-base personnel and addresses on the existing mailing list.

g. Provide draft and final deliverables. Provide two advance copies to the AFCEE RTC and to the 11 CEOS Community Relations Coordinator for acceptance prior to preparation of the final deliverables.

h. Provide poster-size map.

i. Submit with the second draft Technical Report.

j. Submit with the Technical Report.

k. Provide with the Technical Report.

l. Provide within four (4) weeks of task completion.

m. Both a draft and a final addendum to the existing work plan is required for the removal actions specified in paragraph I.1.3.14. Field removal activities performed at Cape Lisburne LRRS pursuant to paragraph I.1.3.14 of this SOW shall commence upon submittal of the draft work plan to AFCEE for review. The Contractor shall distribute both versions of the work plan as specified by AFCEE.

n. The SAP addendum shall focus on the sampling and analysis activities to be conducted under the removal actions specified in paragraph I.1.3.14 of this SOW. The Contractor shall incorporate any Government comments into the final project-specific SAP. The Contractor shall distribute the SAP as specified by AFCEE.

o. A Site Characterization Summary ITIR must be prepared based on the findings of sampling and analyses conducted pursuant to the removal action specified in paragraph I.1.3.14. The Contractor shall incorporate any Government comments into the final ITIR. The Contractor shall distribute the ITIR as specified by AFCEE.

~~Notes:~~

a ~~Unless an abbreviated list of analytes is specified under "Parameter" above, the analytical protocol shall include all analytes listed in the referenced analytical method. The methods cited are from the following sources:~~

~~"A" Methods — Standard Methods for the Examination of Water and Wastewater, 16th Edition (1985)~~

~~"E" Methods — Methods for Chemical Analysis of Water and Wastes, EPA Manual, 600/4-79-020 (USEPA, 1983--with additions)~~

~~"SW" Methods — Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition (USEPA, 1986)~~

~~"ASTM" Methods — American Society for Testing and Materials, 1919 Race Street, Philadelphia, PA 19103~~

b ~~The maximum number of second-column confirmation analyses shall not exceed fifty (50) percent of the actual number of field samples (to include duplicates, replicates, ambient, condition blanks, trip blanks, and equipment blanks). If the number of samples requiring second-column confirmation exceeds this allowance, contact the HSD Technical Project Manager. The total number of samples listed in Tables A-4 and A-5 includes the allowance applicable to each GC method. IF GC/MS, or a combination of second-column GC and GC/MS, is used, the total cost of all such analyses for a particular parameter shall not exceed the funding allowed for positive confirmation using only second-column GC.~~

REF 68X 68X

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. PAGE 1 OF 3

2. PROC INSTRUMENT ID NO. (PIIN)	3. SPIIN	4. EFFECTIVE DATE	5. REQUISITION/PURCHASE REQUEST PROJECT NO.	6. BCC/DMS RATING
F33615-90-D-4010	002205	20SEP94	FY7624-94-08822	

7. ISSUED BY CODE FA8900

DEPARTMENT OF THE AIR FORCE
AIR FORCE MATERIAL COMMAND
HUMAN SYSTEMS CENTER
BROOKS AFB TX 78235-5320

Buyer: EDWIN CUSTODIO HSC/PKVBC
Phone: (210)536-4493

8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) CODE S2404A

DCMAO BALTIMORE
ATTN: CHESAPEAKE
200 TOWSONTOWN BLVD, WEST
TOWSON, MD 21204-5299

DUPLICATE ORIGINAL

9. CONTRACTOR NAME AND ADDRESS CODE 69148 FACILITY CODE

IF "9" FOR MULTIPLE FACILITIES SEE SECT "K"

ICF TECHNOLOGY
9300 LEE HIGHWAY
FAIRFAX VA 22031-1207

PHONE:(703)934-3000
COUNTRY:FAIRFAX

MAIL DATE
SEP 23 1994

10. SECURITY CLAS U

11. DISCOUNT FOR PROMPT PAYMENT

1ST % DAYS NET DAYS
2ND % DAYS OTHER
3RD % DAYS IF "0" SEE SECT "E"

12. PURCHASE OFFICE POINT OF CONTACT

MVH/M1E/MVH

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in block 17. The hour and date specified for receipt of Offers ☐ is extended ☐ is not extended

14. THIS BLOCK APPLIES ONLY TO MODIFICATION OF CONTRACTS

☐ THIS CHANGE IS ISSUED PURSUANT TO ______ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVED NUMBERED CONTRACT/ORDER.

☐ THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.

☐ THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF ______ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.

☒ THIS MODIFICATION IS ISSUED PURSUANT TO FAR 52.232-7 PAYMENT UNDER T&M OR LABOR HOURS

15. CONTRACT ADMINISTRATION DATA

A. KIND OF MOD	B. MOD ABST RECIPIENT ADP PT	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PO/CAO ON TRANSFER	F. GAINING PO/CAO ON TRANSFER	G. SVC/AGENCY USE
C			$ SEE SECTION G			

16. ENTER ANY APPLICABLE CHANGES

A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1) TYPE (2) KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE	H. DATE SIGNED	I. SECURITY (1) CLAS (2) DATE OF DD 254

17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.) SUBJECT: INCREASE CEILING AMOUNT/ FUND OVERRUN

PROJECT MANAGER: SAMER N. KARMI, AFCEE/ERDW, BROOKS AFB, TX 78235-5328
FINANCE OFFICE:(SC1030)DFAS-COLUMBUS CENTER, DFAS-CO/CHESAPEAKE DIV
COLUMBUS, OH 43218-2262

18. ☒ CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT ☐ CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN ___ COPIES TO ISSUING OFFICE

19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)

BY

22. UNITED STATES OF AMERICA (Signature of Contracting Officer)

BY

20. NAME AND TITLE OF SIGNER (Type or print)

21. DATE SIGNED

23. NAME OF CONTRACTING OFFICER (Type or print)

DEAN M. CARSELLO

24. DATE SIGNED 20 SEP 1994

1. Pursuant to FAR 52.232-7 Payment Under Time-and-Material and Labor-Hours Contracts and in accordance with the provisions of the Basic Contract F33615-90-D-4010 and Delivery Order 0022, Mod. 05 the above delivery order is amended. The purpose of this modification is to increase the ceiling amount of this order by $330,000.00 to cover the total cost of the efforts being requested. The ceiling is being increased to cover existing work.

2. As a result of paragraph 1 above, said order is more specifically modified as follows:

a. SECTION A Cover Page: The ceiling amount in Block 20 (cover page) is increased by $330,000.00 from $3,528,878.00 to $3,858,878.00.

b. SECTION B Supplies/Services: is amended as set forth below.

Item No.	Supplies Schedule	Qty Purch Unit	Unit Price
0001	CLIN Change Sec Class: U Noun: Sampling, Analysis, and Data Acrn: XA nsn: N Sites Codes: pqa: D acp: D fob: D		N
0002	CLIN Change Sec Class: U Noun: Support Acrn: XA nsn: N Sites Codes: pqa: D acp: D fob: D		N
0004	CLIN Change Sec Class: U Noun: Chemical Analysis & Data Acrn: XA nsn: N Sites Codes: pqa: D acp: D fob: D		N

pr/mipr data: FY7624-94-08822

b. SECTION G Accounting Classification Data: is amended as set forth below:

ACRN	Acct Class Data	Appropriation/Lmt Subhead/CPN Recip DODAAD Supplemental Accounting Classification	Obligation Amount
AD	Account Establish		$330,000.00
	Unclassified	5743400 F74400	
		304 7434 434419 040000 53475 000000 674400	

pr/mipr data: FY7624-94-08822 (PR Complete)

descriptive data: AF Form 616 H94-SR-365 dated: 18 Aug 94 expiration: 22 Sep 94

XA Special ACRN Establish

descriptive data: Special ACRN XA Funds CLINs 0001, 0002, and 0004 and includes the following:

AA:	$ 299,855.00	(Basic DO)
AB:	99,986.00	(Mod. -01)
	2,899,511.00	(Mod. -02)
AC:	229,526.00	(Mod. -04)
AD:	330,000.00	(Mod. -05)
TOTAL	$3,858,878.00	

Finance Officer: Pay funds in alphabetical order.

3. Concurrence to this Unilateral Agreement is evidenced by contractor's (ICF) letter dated 8 Jun 94, incorporated herein by reference.

4. All other terms and conditions remain unchanged and in full force and effect.

REF 68X 68X

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. PAGE 1 OF 4

2. PROC INSTRUMENT ID NO. (PIIN)	3. SPIIN	4. EFFECTIVE DATE	5. REQUISITION/PURCHASE REQUEST PROJECT NO.	6. DOC/DMS RATING
F33615-90-D-4010	002206	27MAR95	FY7624-95-08452	DO-C9

7. ISSUED BY CODE FA8900

DEPARTMENT OF THE AIR FORCE
AIR FORCE MATERIEL COMMAND
HUMAN SYSTEMS CENTER
8005 9TH STREET
BROOKS AFB TX 78235-5353
Buyer: EDWIN CUSTODIO /PKVBA
Phone: (210) 536-4493

8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) CODE S2404A

DCMAO BALTIMORE
ATTN: CHESAPEAKE
200 TOWSONTOWN BOULEVARD, WEST
TOWSON MD 21204-5299

9. CONTRACTOR NAME AND ADDRESS CODE 69418 FACILITY CODE

IF "Y" FOR MULTIPLE FACILITIES SEE SECT "K"

ICF TECHNOLOGY, INC.
9300 LEE HIGHWAY
FAIRFAX, VA 22301-3000

COUNTY: FAIRFAX
PHONE: (703)934-3000

ADVANCE COPY

10. SECURITY CLAS U

11. DISCOUNT FOR PROMPT PAYMENT

1 ST % DAYS NET DAYS
2 ND % DAYS OTHER IF "Y" SEE SECT "E"
3 RD % DAYS

12. PURCHASE OFFICE POINT OF CONTACT

MVH/M1U/MVH

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in block 17. The hour and date specified for receipt of offers ☐ is extended ☐ is not extended

14. THIS BLOCK APPLIES ONLY TO MODIFICATION OF CONTRACTS

☐ THIS CHANGE IS ISSUED PURSUANT TO ________ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.

☐ THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.

☐ THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF ________ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.

☒ THIS MODIFICATION IS ISSUED PURSUANT TO IAW FAR 52.232-7 PAYMENT UNDER T&M AND LABOR HOURS

15. CONTRACT ADMINISTRATION DATA

A. KIND OF MOD	B. MOD ABST RECIPIENT ADP PT	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PO/CAO ON TRANSFER	F. GAINING PO/CAO ON TRANSFER	G. SVC/AGENCY USE
B			SEE SECTION G			

16. ENTER ANY APPLICABLE CHANGES

A. PAY CODE	B. EFFECTIVE DATE OF AWARD	C. CONTRACT (1) TYPE (2) KIND	D. TYPE CONTR	E. SURV CRIT	F. SPL CONTR PROVISIONS	G. PAYING OFC CODE	H. DATE SIGNED	I. SECURITY (1) CLAS (2) DATE OF DD 254

17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.) SUBJECT: INCREASE TO THE CONTRACT CEILING PRICE

PROJECT MANAGER: SAMER KARMI, AFCEE/ERD, BROOKS AFB TX 78235-5353
FINANCE OFFICE: (SC1030) DFAS-COLUMBUS CENTER, DFAS-CO/CHESAPEAKE DIV
P O BOX 182264, COLUMBUS OH 43218-2264

18. ☒ CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT ☐ CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN ____ COPIES TO ISSUING OFFICE

19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)		22. UNITED STATES OF AMERICA (Signature of Contracting Officer)	
BY		BY Janelle J. Larrison	
20. NAME AND TITLE OF SIGNER (Type or print)	21. DATE SIGNED	23. NAME OF CONTRACTING OFFICER (Type or print)	24. DATE SIGNED
		JANELLE J. LARRISON	95 Mar 27

AFMC FORM 702, JUL 92 REPLACES AFSC FORM 702, AUG 84 WHICH IS OBSOLETE

1. Pursuant to FAR 52.232-7 Payment Under Time-and-Material and Labor-Hours Contracts and in accordance with the provisions of the Basic Contract F33615-90-D-4010 and Delivery Order 0022, Mod. 06 the above delivery order is amended. The purpose of this modification is to increase the ceiling amount of this order by $315,000.00 to cover the total cost of the efforts being requested. The ceiling is being increased to cover existing work in the revised Work Plan.

2. As a result of paragraph 1 above, said order is more specifically modified as follows:

a. SECTION A Cover Page: The ceiling amount in Block 20 (cover page) is increased by $315,000.00 from $3,858,878.00 to $4,173,878.00.

b. SECTION B Supplies/Services: is amended as set forth below.

Item No.	Supplies Schedule	Qty Purch Unit	Unit Price
0001	CLIN Change Sec Class: U Noun: Sampling, Analysis, and Data Acrn: XA nsn: N Sites Codes: pqa: D acp: D fob: D		N
0002	CLIN Change Sec Class: U Noun: Support Acrn: XA nsn: N Sites Codes: pqa: D acp: D fob: D		N
0004	CLIN Change Sec Class: U Noun: Chemical Analysis & Data Acrn: XA nsn: N Sites Codes: pqa: D acp: D fob: D		N

pr/mipr data: FY76-95-08452

c. SECTION F Supplies schedule Data: The delivery schedule is modified as set forth below:

Item No.	Supplies Schedule Data		Delivery Quantity	Schedule Date
0001	CLIN Del Sch Change acrn: XA ship to: U	Sec Class: U	1	96 Jan 31
0002	CLIN Del Sch Change acrn: XA ship to: U	Sec Class: U	1	96 Jan 31
0004	CLIN Del Sch Change acrn: XA ship to: U	Sec Class: U	1	96 Jan 31

b. SECTION G Accounting Classification Data: is amended as set forth below:

ACRN	Acct Class Data	Appropriation/Lmt Subhead/CPN Recip DODAAD Supplemental Accounting Classification	Obligation Amount
AE	Account Establish Unclassified	5753400 F74400 305 7434 434419 040000 53440 000000 674400	$315,000.00

pr/mipr data: FY7624-95-08452 (PR Complete)

descriptive data: AF Form 616 H95-SR-298 dated: 1 Mar 95, expiration 15 Sep 95.

XA Special ACRN Establish

descriptive data: Special ACRN XA Funds CLINs 0001, 0002, and 0004 includes the following:

AA:	$ 299,855.00 (Basic DO)
AB:	99,986.00 (Mod.-01)
	2,899,511.00 (Mod.-02)
AC:	229,526.00 (Mod.-04)
AD:	330,000.00 (Mod.-05)
AE:	315,000.00 (Mod.-06)
	$4,173,878.00

Finance Officer: Pay funds in alphabetical order.

3. Concurrence to this Unilateral Agreement is evidenced by contractor's (ICF) letter dated 18 Jan 95, incorporated herein by reference.

4. All other terms and conditions remain unchanged and in full force and effect.

APPENDIX D

SAMPLE COLLECTION LOGS

SAMPLE COLLECTION LOGS FOR THE DEACTIVATED LANDFILL (LF01)

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-LF01-2SW10

RADAR STATION: Point Lay WEATHER: Rainy, breezy, 35°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Downstream of LF01-SW04 & SD04, 247° to SW corner of hangar, 322° to SE corner of hangar, 349° to radome.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JD

TIME SAMPLED: 17:45 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Same location as LF01-2SD13.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109841303\LF012SW1

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-LF01-2SW09

RADAR STATION: Point Lay WEATHER: Rainy, breezy, 35°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Upstream of SS07-SD04 & SW04, 346° to SE corner of hangar, 384.5° to SW corner of hangar, 359° to radome.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JD

TIME SAMPLED: 17:30 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Same location as SS07-2SD12.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED								
ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER		ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml		4 oz
PCB				SVOC (8270)		1 liter		8 oz
PESTICIDES				TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓			TDS		250 ml		---
VPH	✓			TSS		250 ml		---
EPH	✓			TOC		500 ml		4 oz
				TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SD01

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Deactivated Landfill LF01 FEET FROM FIXED POINT: 100 MAGNETIC HEADING: 48.5°

FIXED POINT: Southeast corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 16:20 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Leachate stream at northeast corner of landfill. Same location as SW01. Organic muck, brown.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\LF01SD01

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SD02

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Deactivated Landfill LF01 FEET FROM FIXED POINT: 204 MAGNETIC HEADING: 104°

FIXED POINT: Southeast corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 16:15 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Marshy surface water at southeast corner of landfill. Same location as SW02. Organic muck (silt).

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\LF01SD02

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SD03

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Deactivated Landfill LF01 FEET FROM FIXED POINT: 268 MAGNETIC HEADING: 110.5°

FIXED POINT: Southeast corner of landfill.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 16:00 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Leachate streams on beach beyond southeast corner of landfill. Same location as SW03. Gravelly sand, minor organics, brown/gray.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\LF01SD03

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SD04

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 204 MAGNETIC HEADING: 157°

FIXED POINT: Southeast corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 14:15 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Intersection of leachate streams near southwest corner of landfill. Same location as SW04. Silty gravel. Minor organic muck.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ■ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES	✓			TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC	✓	500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SD05

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 135 MAGNETIC HEADING: 143°

FIXED POINT: Southwest corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 15:05 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Surface water pool along west edge of landfill. Same location as SW05. Silty gravel with organic muck.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\LF01SD05

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SD06

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 57 MAGNETIC HEADING: 211.5°

FIXED POINT: Southwest corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 14:50 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Surface water along northwest corner of landfill. Same location as SW07. Organic silt, muck, occasional gravel.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SD07

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 114 MAGNETIC HEADING: 264°

FIXED POINT: Southwest corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 14:42 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Surface water body adjacent to POL line. Same location as SW07. Sandy gravel, minor fines, organic matter present.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\LF01SD07

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SD08

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 104 MAGNETIC HEADING: 157°

FIXED POINT: Southeast corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 14:15 (14:20 on bottles) DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Replicate of LF01-SD04. Silty gravel, organic material present.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ■ Replicate of Soil Sample ID LAY-LF01-SD04

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES	✓			TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC	✓	500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SD09

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 270 MAGNETIC HEADING: 127°

FIXED POINT: Southeast corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 15:50 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Leachate stream on beach, off center of landfill. Gravelly sand, minor fines. Soil is brown/gray.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\LF01SD09

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SD10

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 285 MAGNETIC HEADING: 140°

FIXED POINT: Southeast corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 15:40 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Sample collected at leachate stream on beach, off southwest corner of landfill. Sandy gravel, minor silt, organic material present. Brown soil.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SD11

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 310 MAGNETIC HEADING: 260°

FIXED POINT: Southwest corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 14:35 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Pool to southwest of POL area. Organic silt.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\LF01SD11

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-LF01-2SD12

RADAR STATION: Point Lay WEATHER: Rain, 25 mph wind, 34°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Upstream of AOC4-SD04 & SW04, 346° to SE corner of hangar, 309.5° to SW corner of hangar, 359° to radome.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JD, SS

TIME SAMPLED: 17:30 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Black muck with large amount of gold to orange algal material. Same location as AOC4-2SW09.

SAMPLING METHOD: Grab (scoop)

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020				TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\LF01SD12

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-LF01-2SD13

RADAR STATION: Point Lay WEATHER: Rain, 25 mph wind, 34°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Downstream of LF01-SW04 & SD04, 297° to SW corner of hangar, 322° to SE corner of hangar, 348° to radome.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JD, SS

TIME SAMPLED: 17:45 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Black mucky gravel with some orange algal (limonitic) material. Same location as LF01-2SW10.

SAMPLING METHOD: Grab (scoop)

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED								
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS		
		WATER	SOIL			WATER		SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml		4 oz
PCB				SVOC (8270)		1 liter		8 oz
PESTICIDES				TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020				TDS		250 ml		---
				TSS		250 ml		---
				TOC		500 ml		4 oz
				TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-LF01-2SD14

RADAR STATION: Point Lay WEATHER: Rain, 25 mph wind, 34°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Uptream of LF01-SW04, SD04, in adjacent leachate stream to LF01-2SW09, 2SD12, 2 feet north and 6 feet east of LF01-2SW09.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JD, SS

TIME SAMPLED: 18:00 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Black and dark brown mottled gravelly muck with significant organic material.

SAMPLING METHOD: Grab (scoop)

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED										
ANALYSES	✓	BARROW LAB CONTAINERS			ANALYSES	✓	ANCHORAGE LAB CONTAINERS			
		WATER		SOIL			WATER		SOIL	
TPH		1 liter		8 oz	VOC (8260)	✓	3 x 40 ml		4 oz	
PCB					SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		---	
VOC-BTEX 8020					TDS		250 ml		---	
					TSS		250 ml		---	
					TOC		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SW01

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 100 MAGNETIC HEADING: 48.5°

FIXED POINT: Southeast corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 16:10 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Leachate stream at northeast corner of landfill. Same location as SD01.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
16:20	7.3	300 μS	10°C	1.000	

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SW02

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 204 MAGNETIC HEADING: 104°

FIXED POINT: Southeast corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 16:10 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Marshy surface water at southeast corner of landfill. Same location as SD02.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
16:15	7.1	550 µS	12°C		

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED									
ANALYSES	✓	BARROW LAB CONTAINERS			ANALYSES	✓	ANCHORAGE LAB CONTAINERS		
		WATER		SOIL			WATER		SOIL
TPH	✓	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB	✓				SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010	✓	1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
					TSS		250 ml		---
					TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SW03
RADAR STATION: Point Lay WEATHER: Sunny, 50°F
SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 310 MAGNETIC HEADING: 260°
FIXED POINT: Southwest corner of hangar.
SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: JP, DN, AP
TIME SAMPLED: 14:30 DEPTH OF SAMPLE (feet):
SAMPLE DESCRIPTION/COMMENTS: Leachate streams on beach beyond southeast corner of landfill. Same location as SD03.

SAMPLING METHOD: Grab
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
14:30	7.8	410 µS	9°C	1.000	

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\LF01SW03

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SW04
RADAR STATION: Point Lay WEATHER: Sunny, 50°F
SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 204 MAGNETIC HEADING: 157°
FIXED POINT: Southeast corner of hangar.
SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: JP, DN, AP
TIME SAMPLED: 15:10 DEPTH OF SAMPLE (feet):
SAMPLE DESCRIPTION/COMMENTS: Intersection of leachate streams near southwest corner of landfill. Same location as SD04.
SAMPLING METHOD: Grab
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
15:10	7.2	810 µS	9°C	1.000	

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES	✓			TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS	✓	1 liter	---
VOC-BTEX 8020	✓			TDS	✓	250 ml	---
				TSS	✓	250 ml	---
				TOC	✓	500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SW05

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 135 MAGNETIC HEADING: 143°

FIXED POINT: Southwest corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 15:00 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Surface water pool along west edge of landfill. Same location as SD05.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
15:00	7.4	460 µS	12°C	1.000	

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SW06

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 57 MAGNETIC HEADING: 211.5°

FIXED POINT: Southwest corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 14:45 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Surface water along northwest corner of landfill. Same location as SD06.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
14:45	7.8	480 µS	11°C	1.001	

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109841303\LF01SW06

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SW07

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 114 MAGNETIC HEADING: 264°

FIXED POINT: Southwest corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 14:40 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Surface water pool adjacent to POL line. Same location as SD07.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
14:40	7.1	900 µS	14°C	1.001	

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-LF01-SW08

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 204 MAGNETIC HEADING: 157°

FIXED POINT: Southeast corner of hangar.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, AP

TIME SAMPLED: 15:10 (15:18 on bottle) DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Intersection of leachate streams near southwest corner of landfill. Same location as SD04.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ■ Duplicate of Water Sample ID LAY-LF01-SW04

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
15:10	7.2	810 µS	9°C	1.001	

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES	✓			TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS	✓	1 liter	---
VOC-BTEX 8020	✓			TDS	✓	250 ml	---
				TSS	✓	250 ml	---
				TOC	✓	500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOGS FOR THE GARAGE (SS06)

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-S01-0.25

RADAR STATION: Point Lay WEATHER: Partly cloudy, slight breeze, 45°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: 25 MAGNETIC HEADING: ______

FIXED POINT: 25 feet due east of west end of garage, 12 feet south of north end of garage.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, RC

TIME SAMPLED: 11:20 DEPTH OF SAMPLE (feet): 0-0.25

SAMPLE DESCRIPTION/COMMENTS: Underneath garage. Brown to dark brown sandy silt, loose, slightly moist.

SAMPLING METHOD: ______

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

BG=0.5	MONITORING READINGS				
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
11:15	25 ppm in BH 7.5 in BZ				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-S02-1

RADAR STATION: Point Lay WEATHER: Partly cloudy, sunny, breezy, 45°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 25 feet due east of west end of garage, 12 feet due south of north end of garage.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, RC

TIME SAMPLED: 11:25 DEPTH OF SAMPLE (feet): 1

SAMPLE DESCRIPTION/COMMENTS: Underneath garage. Brown to dark brown sandy silt, loose, slightly moist. Sample taken immediately above permafrost.

SAMPLING METHOD: ______

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
11:23	700 in BH, BG=0.5, 1.7 ppm in BZ				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER		BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER		ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB	✓				SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010	✓	1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
					TSS		250 ml		---
					TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-S03-0.5

RADAR STATION: Point Lay WEATHER: Partly cloudy, sunny, breezy, 50°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: 20 MAGNETIC HEADING: 98°

FIXED POINT: Southwest corner at garage.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 11:50 DEPTH OF SAMPLE (feet): 0-0.5

SAMPLE DESCRIPTION/COMMENTS: Gravelly sand, gray - gray brown, saturated soils, medium to coarse sand, 40-50% gravel.

SAMPLING METHOD:

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

BG=0.5 MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
11:55	BG in BZ				
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES	✓			TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS06-S03

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-S04

RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: See below

FIXED POINT: 36° to northwest corner of garage, 82° to southwest corner of garage, 112° to top of radome.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 12:50 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Sandy gravel, gray brown, saturated, loose, 70% gravel, 1/8-1/2 inch gravel, large gravel removed. Sample taken at groundwater.

SAMPLING METHOD: Hand auger

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

BG=0.5

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
12:55	30 in BH, BG in BZ				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-S05-1.5
RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F
SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______
FIXED POINT: 42° to northwest corner of garage, 61° to southwest corner of garage, 86° to top of radome.
SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: SS, RC
TIME SAMPLED: 13:05 DEPTH OF SAMPLE (feet): 1.5
SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-SS06-S06 (S05 is shallow). Clayey silt, gray, very wet, firm, trace organics, peat.
SAMPLING METHOD: Hand auger
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

BG=0	MONITORING READINGS				
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
13:10	22.8 in BH, BG in BZ				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet)
(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-S06-2.5
RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F
SITE/AOC: Garage SS06 FEET FROM FIXED POINT: MAGNETIC HEADING:
FIXED POINT: 42° to northwest corner of garage, 61° to southwest corner of garage, 86° to top of radome.
SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: SS, RC
TIME SAMPLED: 13:15 DEPTH OF SAMPLE (feet): 2.5
SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-SS06-S05 (S06 is deep). Brown silty peat, gray, very wet.

SAMPLING METHOD: Hand auger
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ■ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

BG=0.5 MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
13:20	16 in BH, 0.5 in BZ				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet)
(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-S07
RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F
SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: See below
FIXED POINT: 107° to northeast corner of main building train, 136° to top of radome, 161° to southeast corner of garage.
SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: JD
TIME SAMPLED: 14:34 DEPTH OF SAMPLE (feet): 0.5
SAMPLE DESCRIPTION/COMMENTS: Salt and pepper, gravelly, coarse sand at the top of the water table.

SAMPLING METHOD: Grab (bucket auger)
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID
☐ Ambient Condition Blank (AB) ■ Replicate of Soil Sample ID LAY-SS06-S10

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
14:32	0.0				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

CHECK ANALYSES REQUESTED											
ANALYSES	✓	BARROW LAB CONTAINERS			ANALYSES	✓	ANCHORAGE LAB CONTAINERS		
		WATER		SOIL			WATER		SOIL
TPH	✓	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB	✓				SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010	✓	1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
					TSS		250 ml		---
					TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet)
(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-S08

RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 55°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 175° to northwest corner of garage, 104° to northeast corner of garage.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: ______

TIME SAMPLED: 15:05 DEPTH OF SAMPLE (feet): 0.3

SAMPLE DESCRIPTION/COMMENTS: Heavily stained, salt and pepper, gravelly, coarse sand with diesel-like odor.

SAMPLING METHOD: Grab (scoop)

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
15:03	38				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES	✓			TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-S09-0.25

RADAR STATION: Point Lay WEATHER: Partly cloudy, sunny, slight breeze, 45°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ________ MAGNETIC HEADING: ________

FIXED POINT: 25 feet due east of west end of garage, 12 feet south of north end of garage.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, RC

TIME SAMPLED: 11:20 DEPTH OF SAMPLE (feet): 0-0.25

SAMPLE DESCRIPTION/COMMENTS: Underneath garage. Replicate of SS06-S01. Brown to dark brown, sandy silt, loose, slightly moist.

SAMPLING METHOD: ________

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ________

☐ Ambient Condition Blank (AB) ■ Replicate of Soil Sample ID LAY-SS06-S01

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

BG=0.5	MONITORING READINGS				
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
11:15	25 ppm in BH				
	7.5 ppm in BZ				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109841303\SS06-S09

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-S10

RADAR STATION: Point Lay WEATHER: Breezy, partly cloudy, 50°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 107° to northeast corner of main building train, 136° to top of radome, 161° to southeast corner of garage.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JD

TIME SAMPLED: 14:38 DEPTH OF SAMPLE (feet): 0.5

SAMPLE DESCRIPTION/COMMENTS: Salt and pepper gravelly coarse sand at the top of the water table.

SAMPLING METHOD: Grab (bucket auger)

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ■ Replicate of Soil Sample ID LAY-SS06-S07

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
14:36	0.0				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-S11-0.5

RADAR STATION: Point Lay WEATHER: Breezy, partly cloudy, 50°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 359° to southeast corner of garage, 342° to northeast corner of garage, 96° to top of radome.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 15:15 DEPTH OF SAMPLE (feet): 0.5

SAMPLE DESCRIPTION/COMMENTS: Gravelly sand, gray-dark gray, very wet, sheen, gravel 1/8-1/2 inch, coarse to fine sand.

SAMPLING METHOD: ______

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

BG=0.5	MONITORING READINGS				
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
	NR				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS06-S11

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS06-2S12-1

RADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 143° to radome, 195° to northwest corner of garage, 232° to north POL tank.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, SF

TIME SAMPLED: 15:20 DEPTH OF SAMPLE (feet): 1

SAMPLE DESCRIPTION/COMMENTS: Wet, sandy gravel, medium to coarse sand, 1/8 to 3/4 inch gravel.

SAMPLING METHOD: Hand auger

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

CHECK ANALYSES REQUESTED									
ANALYSES	✓	BARROW LAB CONTAINERS			ANALYSES	✓	ANCHORAGE LAB CONTAINERS		
		WATER		SOIL			WATER		SOIL
TPH		1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB					SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
VPH	✓				TSS		250 ml		---
EPH	✓				TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS06-2S13-.5

RADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 76° to northeast corner of garage, 125° to northwest corner of garage, 228° to north POL tank.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, SF

TIME SAMPLED: 15:13 DEPTH OF SAMPLE (feet): 0.5

SAMPLE DESCRIPTION/COMMENTS: Taken at interface of brown peat and gray, clayey silt, moist.

SAMPLING METHOD: Hand auger

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH		1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS06-2S14-4.5

RADAR STATION: Point Lay WEATHER: Overcast, windy, drizzle, 32°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Southwest of garage, 12 feet west of west end, 33 feet south of south end.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 15:30 DEPTH OF SAMPLE (feet): 4.5

SAMPLE DESCRIPTION/COMMENTS: Brown gravel, sand, fine to coarse sand, 1/8 to 1 inch gravel.

SAMPLING METHOD: Hand auger

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER		BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER		ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB					SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
VPH	✓				TSS		250 ml		---
EPH	✓				TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS06-2S15-4

RADAR STATION: Point Lay WEATHER: Overcast, windy, drizzle, 35°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: South of garage, 10 feet east of west end, 46 feet south of south end.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, JP

TIME SAMPLED: 15:40 DEPTH OF SAMPLE (feet): 4

SAMPLE DESCRIPTION/COMMENTS: Gravelly sand, 1/4 to 1.5 inch gravel, fine to coarse sand.

SAMPLING METHOD: Hand auger

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH		1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet)
(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS062S15

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS06-2S16

RADAR STATION: Point Lay WEATHER: Overcast, windy, drizzle, 35°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Southwest of garage, 15 feet west of west side, 67 feet south of south end, between fuel tanks.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP

TIME SAMPLED: 15:50 DEPTH OF SAMPLE (feet): 6

SAMPLE DESCRIPTION/COMMENTS: Gravelly sand, fine to coarse sand, 1/4 to 1 inch gravel.

SAMPLING METHOD: Hand auger

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

CHECK ANALYSES REQUESTED										
ANALYSES	✓	BARROW LAB CONTAINERS WATER		SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER		SOIL
TPH		1 liter		8 oz	VOC (8260)	✓	3 x 40 ml		4 oz
PCB					SVOC (8270)	✓	1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
VPH	✓				TSS		250 ml		---
EPH	✓				TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS06-2S18

RADAR STATION: Point Lay WEATHER: Overcast, windy, drizzle, 35°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Southwest of garage, 15 feet west of west side, 67 feet south of south end, between fuel tanks.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP

TIME SAMPLED: 15:55 DEPTH OF SAMPLE (feet): 6

SAMPLE DESCRIPTION/COMMENTS: Gravelly sand, fine to coarse sand, 1/4 to 1 inch gravel.

SAMPLING METHOD: Hand auger

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ■ Duplicate of Water Sample ID LAY-SS06-2S16

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)	✓	1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS062S18

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS06-2SD05

RADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 121° to northeast corner of garage, 173° to northwest corner of garage, 227.5° to north POL tank.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, RC

TIME SAMPLED: 15:15 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Brown, silty peat, heavy organic material, saturated.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet)
(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS06-2SD06

RADAR STATION: Point Lay WEATHER: Overcast, windy, drizzle, 32°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 181° to north POL tank, 91° to radome, 78° to northeast corner of garage.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP

TIME SAMPLED: 15:25 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Saturated, gravelly sand, medium to coarse sand, 1/4 to 1.5 inch gravel.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)	✓	1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS062SD6

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS06-2SD07
RADAR STATION: Point Lay WEATHER: Overcast, windy, drizzle, 32°F
SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______
FIXED POINT: 135.5° to north POL tank, 70.5° to radome, 57° to northwest corner of garage.
SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: JP
TIME SAMPLED: 15:35 DEPTH OF SAMPLE (feet): ______
SAMPLE DESCRIPTION/COMMENTS: Saturated, gravelly sand, fine to coarse sand, 1/4 to 1.5 inch gravel.

SAMPLING METHOD: Grab
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	SOIL
TPH		1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-SD01

RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 24° to southwest corner of garage, 97° to top of radome, 356° to northwest corner of garage.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 14:30 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-SS06-SW01. Sandy gravel, saturated, iron staining, distinct hydrocarbon odor.

SAMPLING METHOD: ______

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

BG=0.5	MONITORING READINGS				
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
14:30	BG in BZ				
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER		BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER		ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB	✓				SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010	✓	1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
					TSS		250 ml		---
					TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS06SD01

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-SD02

RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 69° to northwest corner of garage, 81° to southwest corner of garage, 96° to top of radome.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 15:40 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-SS06-SW02. Grayish-black sandy gravel, saturated, iron staining, 1/4 to 1.5 inch gravel, sampled sand and <.5 inch gravel.

SAMPLING METHOD: ______

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-SD03

RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ____ MAGNETIC HEADING: ____

FIXED POINT: 61° to northwest corner of garage, 88° to southwest corner of garage, 89° to top of radome.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 13:34 DEPTH OF SAMPLE (feet): ____

SAMPLE DESCRIPTION/COMMENTS: Pea gravel to 3/4 inch, 5-8% sand, iron staining, organic material present. Sample taken at outflow of culvert.

SAMPLING METHOD: ____

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ____

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ____

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

BG=0.5	MONITORING READINGS				
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
13:40	BG in BZ				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-SD04

RADAR STATION: Point Lay WEATHER: Partly cloudy, 45°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 98° to northeast corner of garage, 80° to top of radome, 110° to southeast corner of main building train.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 16:05 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Same location. Dark gray, sandy gravel, iron staining, sheen on sample, saturated.

SAMPLING METHOD: ______

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-SW01
RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F
SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______
FIXED POINT: 24° to southwest corner of garage, 97° to top of radome, 356°to northwest corner of garage.
SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: SS, RC
TIME SAMPLED: 14:20 DEPTH OF SAMPLE (feet): ______
SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-SS06-SD01.

SAMPLING METHOD: ______
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
13:35	7.5	820 μS	10°C	1.001	

BG=0.5	MONITORING READINGS				
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
14:22	BG in BZ				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED										
ANALYSES	✓	BARROW LAB CONTAINERS			ANALYSES	✓	ANCHORAGE LAB CONTAINERS			
		WATER		SOIL			WATER		SOIL	
TPH	✓	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz	
PCB					SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		---	
VOC-BTEX 8020	✓				TDS		250 ml		---	
					TSS		250 ml		---	
					TOC		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-SW02

RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 69° to northwest corner of garage, 81° to southwest corner of garage, 96° to top of radome.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 15:25 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-SS06-SD02.

SAMPLING METHOD: ______

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
13:35	7.4	590 μS	8°C	1.002	

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER		BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER		ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter		8 oz	VOC (8260)	✓	3 x 40 ml		4 oz
PCB					SVOC (8270)	✓	1 liter		8 oz
PESTICIDES					TOTAL METALS	✓	1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS	✓	1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
					TSS		250 ml		---
					TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS06SW02

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-SW03

RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 29° to southwest corner of garage, 97° to top of radome, 356° to northwest corner of garage.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 14:25 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Duplicate of SW01.

SAMPLING METHOD: ______

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ■ Duplicate of Water Sample ID LAY-SS06-SW01

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
13:31	7.5	820 µS	10°C	1.001	

BG=0.5	MONITORING READINGS				
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
14:27	BG in BZ				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS06SW03

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS06-SW04

RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F

SITE/AOC: Garage SS06 FEET FROM FIXED POINT: ________ MAGNETIC HEADING: ________

FIXED POINT: 78° to NE corner of garage, 86° to top of radome, 120° to SE corner of main building train.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 16:00 DEPTH OF SAMPLE (feet): ________

SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-SS06-SD04.

SAMPLING METHOD: ________

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ________

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ________

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
13:35	7.3	560 μS	11°C	1.000	

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOGS FOR THE DRAINAGE PATHWAY FROM POL TANKS (SS07)

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS07-2SD05

RADAR STATION: Point Lay WEATHER: Raining, 31°F

SITE/AOC: POL Drainage SS07 FEET FROM FIXED POINT: MAGNETIC HEADING:

FIXED POINT: Downstream of SS07-SW01 and SD01, at base of bluff, next to beach, 16° to radome.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: ASP, JP

TIME SAMPLED: 17:25 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Sandy gravel. Same location as SS07-2SW05.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED									
ANALYSES	✓	BARROW LAB CONTAINERS			ANALYSES	✓	ANCHORAGE LAB CONTAINERS		
		WATER		SOIL			WATER		SOIL
TPH		1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB					SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
VPH	✓				TSS		250 ml		---
EPH	✓				TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS072SD5

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS07-2SD06

RADAR STATION: Point Lay WEATHER: Raining, 31°F

SITE/AOC: POL Drainage SS07 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Downstream of SS07-SW02 and SD02, 62° to radome, 18° to north POL tank, near base of bluff.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: ASP, JP

TIME SAMPLED: 17:35 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Sandy gravel. Same location as SS07-2SW06.

SAMPLING METHOD: Scoop grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS07-2SD07

RADAR STATION: Point Lay WEATHER: Raining, 34°F

SITE/AOC: POL Drainage SS07 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Upstream of SS07-SW04, 66° to radome, 18° to north POL tank, 154° to middle of hangar.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP

TIME SAMPLED: 16:00 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Rust surface color, sandy gravel.

SAMPLING METHOD: Scoop grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet)
(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS072SD7

SAMPLE COLLECTION LOG

DATE: 9/07/93 SAMPLE ID: LAY-SS07-2SW04

RADAR STATION: Point Lay WEATHER: Raining, breezy, 34°F

SITE/AOC: POL Drainage, SS07 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Downstream of SS07, same location as SS07-SW03 and SS07-SD03.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP

TIME SAMPLED: 16:00 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Clear above rust colored sediment.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 9/07/93 SAMPLE ID: LAY-SS07-2SW05
RADAR STATION: Point Lay WEATHER: Overcast, rain, breezy, 35°F
SITE/AOC: POL Drainage, SS07 FEET FROM FIXED POINT: MAGNETIC HEADING:
FIXED POINT: Downstream of SS07-SW01 and SD01, at base of bluff, next to beach, 16° to radome.
SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: JP, ASP
TIME SAMPLED: 17:20 DEPTH OF SAMPLE (feet):
SAMPLE DESCRIPTION/COMMENTS:

SAMPLING METHOD: Grab
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet)
(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS072SW5

SAMPLE COLLECTION LOG

DATE: 9/07/93 SAMPLE ID: LAY-SS07-2SW06

RADAR STATION: Point Lay WEATHER: Drizzling, breezy, 31°F

SITE/AOC: POL Drainage SS07 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Downstream of SS07-SW02 and SD02, 62° to radome, 18° to north POL tanks near base of bluff.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, ASP

TIME SAMPLED: 17:30 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Clear.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	—
VOC-BTEX 8020	✓			TDS		250 ml	—
VPH	✓			TSS		250 ml	—
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS07-SD01
RADAR STATION: Point Lay WEATHER:
SITE/AOC: POL Drainage SS07 FEET FROM FIXED POINT: 156 MAGNETIC HEADING: 200.5°
FIXED POINT: Southwest corner of berm around horizontal tanks.
SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: JP, DN, JD
TIME SAMPLED: 13:25 DEPTH OF SAMPLE (feet):
SAMPLE DESCRIPTION/COMMENTS: Beginning of south leachate stream. Same location as LAY-SS07-SW01. Organic, silt.

SAMPLING METHOD: Grab
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES	✓			TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS07SD01

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS07-SD02

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: POL Drainage SS07 FEET FROM FIXED POINT: 120 MAGNETIC HEADING: 214°

FIXED POINT: Southwest corner of berm around horizontal tanks.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, JD

TIME SAMPLED: 13:00 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Beginning of middle leachate stream. Same location as SW02. Gravelly silt, considerable organics.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)	✓	1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS07-SD03

RADAR STATION: Point Lay WEATHER: Sunny, 48°F

SITE/AOC: POL Drainage SS07 FEET FROM FIXED POINT: 159 MAGNETIC HEADING: 231°

FIXED POINT: Southwest corner of berm around horizontal tanks.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, JD

TIME SAMPLED: 11:45 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Pool at bottom of north leachate stream. Same location as LAY-SS07-SW03. Silt with occasional gravel.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS07SD03

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS07-SD04

RADAR STATION: Point Lay WEATHER: Sunny, 50°F

SITE/AOC: POL Drainage SS07 FEET FROM FIXED POINT: 132 MAGNETIC HEADING: 231°

FIXED POINT: Southwest corner of berm around horizontal tanks.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, JD

TIME SAMPLED: 13:15 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Headwater of small leachate stream. Gravelly silt. Considerable organic material present.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS07-SW01

RADAR STATION: Point Lay WEATHER:

SITE/AOC: POL Drainage SS07 FEET FROM FIXED POINT: 156 MAGNETIC HEADING: 200.5°

FIXED POINT: Southwest corner of berm around horizontal tanks.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN

TIME SAMPLED: 13:20 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Beginning of south leachate stream. Same location as SD01.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
13:20	6.9	>1,990 μS	6°C	1.001	

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS07-SW02

RADAR STATION: Point Lay WEATHER: Sunny, 48°F

SITE/AOC: POL Drainage SS07 FEET FROM FIXED POINT: 120 MAGNETIC HEADING: 214°

FIXED POINT: Southwest corner of berm around horizontal tanks.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN, JD

TIME SAMPLED: 12:52 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Beginning of middle leachate stream. Same location as SD02.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
13:00	7.1	>1,990 µS	9°C	1.001	

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)	✓	1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS	✓	250 ml	---
				TSS	✓	250 ml	---
				TOC	✓	500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS07-SW03

RADAR STATION: Point Lay WEATHER:

SITE/AOC: POL Drainage SS07 FEET FROM FIXED POINT: 159 MAGNETIC HEADING: 231°

FIXED POINT: Southwest corner of berm around horizontal tanks.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS:

TIME SAMPLED: DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Pool at bottom of north leachate stream. Same location as SD03.

SAMPLING METHOD:

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
11:40	7.2	>1,990 µS	6°C	1.001	

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED										
ANALYSES	✓	BARROW LAB CONTAINERS			ANALYSES	✓	ANCHORAGE LAB CONTAINERS			
		WATER		SOIL			WATER		SOIL	
TPH	✓	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz	
PCB					SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		---	
VOC-BTEX 8020	✓				TDS		250 ml		---	
					TSS		250 ml		---	
					TOC		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS07SW03

SAMPLE COLLECTION LOGS FOR THE CRUSHED DRUM AREA (SS08)

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-SS08-S01-0.5
RADAR STATION: Point Lay WEATHER: Overcast, 48°F
SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 48 MAGNETIC HEADING: 0
FIXED POINT: Northeast corner of module train.
SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: AP, DN
TIME SAMPLED: 12:55 DEPTH OF SAMPLE (feet): 6"
SAMPLE DESCRIPTION/COMMENTS: At mouth of culvert. Sandy gravel, 50% gravel to 1/2-inch, 10% fines, loose, saturated, strong diesel odor and discoloration, gray. Sample collected just above water table.
SAMPLING METHOD: Hand auger - grab
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
12:55	464 BH				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES	✓			TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS08-S01

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-SS08-S02-2

RADAR STATION: Point Lay WEATHER: Overcast, 48°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 126 MAGNETIC HEADING: 15°

FIXED POINT: Northeast corner of module train.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, DN

TIME SAMPLED: 11:55 DEPTH OF SAMPLE (feet): 2

SAMPLE DESCRIPTION/COMMENTS: East edge of gravel area. Gravelly sand, gravel to 1/2-inch, minor fines, loose, moist, gray-brown sands.

SAMPLING METHOD: Soil auger - grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
11:55	0 S				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-SS08-S03-2

RADAR STATION: Point Lay WEATHER: Overcast, 48°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 165 MAGNETIC HEADING: 3°

FIXED POINT: Northeast corner of module train.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, DN

TIME SAMPLED: 11:40 DEPTH OF SAMPLE (feet): 2

SAMPLE DESCRIPTION/COMMENTS: Northeast edge of gravel area. Gravelly sand, gravel to 1/2-inch, loose, moist, gray-brown. Sampled directly above peat. Tight clay encountered at 1 foot.

SAMPLING METHOD: Soil auger - grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
11:40	0 S				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED								
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS		
		WATER	SOIL			WATER		SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB	✓			SVOC (8270)		1 liter		8 oz
PESTICIDES				TOTAL METALS		1 liter		8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓			TDS		250 ml		---
				TSS		250 ml		---
				TOC		500 ml		4 oz
				TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-SS08-S04-0.5

RADAR STATION: Point Lay WEATHER: Overcast, 48°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 186 MAGNETIC HEADING: 344.5° FIXED

POINT: Northeast corner of module train. SAMPLE

MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, DN

TIME SAMPLED: 11:30 DEPTH OF SAMPLE (feet): 6"

SAMPLE DESCRIPTION/COMMENTS: North edge of gravel area. Sandy gravel to 1 inch, sandy, minor fines, organics, loose, saturated, gray-brown soils. Sample collected at water table.

SAMPLING METHOD: Soil auger - grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
11:30	0 S				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-SS08-S05-2

RADAR STATION: Point Lay WEATHER: Overcast, 48°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 141 MAGNETIC HEADING: 346°

FIXED POINT: Northeast corner of module train.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, DN

TIME SAMPLED: 11:15 DEPTH OF SAMPLE (feet): 2

SAMPLE DESCRIPTION/COMMENTS: Next to circular depression. Sandy gravel to 1 inch, sandy, loose, damp, gray-brown soils. Sampled directly above dark brown peat.

SAMPLING METHOD: Soil auger - grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
11:30	0 S				
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED										
		BARROW LAB					ANCHORAGE LAB			
ANALYSES	✓	CONTAINERS			ANALYSES	✓	CONTAINERS			
		WATER		SOIL			WATER		SOIL	
TPH	✓	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz	
PCB	✓				SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010	✓	1 x 40 ml		4 oz	DISS METALS		1 liter		---	
VOC-BTEX 8020	✓				TDS		250 ml		---	
					TSS		250 ml		---	
					TOC		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-SS08-S06-0.5

RADAR STATION: Point Lay WEATHER: Overcast, 50°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 114 MAGNETIC HEADING: 26.5°

FIXED POINT: Northeast corner of module train.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, DN

TIME SAMPLED: 13:15 DEPTH OF SAMPLE (feet): 7"

SAMPLE DESCRIPTION/COMMENTS: At flat area at terminus of ditch. Gravelly sand, 50% sand, gravel to 1/2-inch, 10% fines. Loose, saturated, dark gray, strong odor, discoloration. Collected above water table.

SAMPLING METHOD:

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
13:15	1,434 BH				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER		BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER		ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter		8 oz	VOC (8260)	✓	3 x 40 ml		4 oz
PCB	✓				SVOC (8270)	✓	1 liter		8 oz
PESTICIDES					TOTAL METALS	✓	1 liter		8 oz
HVOC 8010	✓	1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
					TSS		250 ml		---
					TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-SS08-S07-0.5

RADAR STATION: Point Lay WEATHER: Overcast, 48°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 48 MAGNETIC HEADING: ______

FIXED POINT: Northeast corner of module train.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, DN

TIME SAMPLED: 12:55 (13:05 on bottles) DEPTH OF SAMPLE (feet): 6"

SAMPLE DESCRIPTION/COMMENTS: At mouth of culvert. Sandy gravel, 50% gravel to 1/2-inch. 10% fines. Loose, saturated, gray.

SAMPLING METHOD: Hand auger-grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ■ Replicate of Soil Sample ID LAY-SS08-S01

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
12:55	464 BH				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES	✓			TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109841303\SS08-S07

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS08-2S08-.5

RADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Under module train, next to culvert mouth, 1 foot from east end, 7 feet from north end.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, RC

TIME SAMPLED: 14:35 DEPTH OF SAMPLE (feet): 0.5

SAMPLE DESCRIPTION/COMMENTS: Wet sandy gravel, fine to coarse sand, 1/2 to 1 inch gravel, sheen, strong odor.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

BG=0

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
14:40	HS = 4				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS08-2S09-.5

RADAR STATION: Point Lay WEATHER: Overcast, windy, 35°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: ____ MAGNETIC HEADING: ____

FIXED POINT: Under module train, 66 feet from east end, 9 feet from south end.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, SF

TIME SAMPLED: 14:40 DEPTH OF SAMPLE (feet): 0.5

SAMPLE DESCRIPTION/COMMENTS: Wet sandy gravel, fine to coarse sand, 1/2 to 1 inch gravel.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ____

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ____

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
14:40	HS = 97				
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED									
ANALYSES	✓	BARROW LAB CONTAINERS			ANALYSES	✓	ANCHORAGE LAB CONTAINERS		
		WATER		SOIL			WATER		SOIL
TPH		1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB					SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
VPH	✓				TSS		250 ml		---
EPH	✓				TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS08-2S10-1

RADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: In ditch under module train, 40 feet from east end, 15 feet from south end.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP

TIME SAMPLED: 14:45 DEPTH OF SAMPLE (feet): 1

SAMPLE DESCRIPTION/COMMENTS: Wet sandy gravel, fine to coarse sand, 1/8 to 1 inch gravel, some organics, trace silt.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

BG=0 MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
14:45	HS = 60				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS08-2S11

RADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: Next to culvert, E end of site, 225° to radome, 24° to NE corner of garage, 240.5° to SW corner of garage

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, JP

TIME SAMPLED: 14:45 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Wet sandy gravel, trace silt, trace organics, medium to coarse sand, 1/8-1 inch gravel.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)	✓	1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS08-2S12-0.5

RADAR STATION: Point Lay WEATHER: Westerly winds, 34°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: ________ MAGNETIC HEADING: ________

FIXED POINT: Under module train, 12 feet south of north end, 85 feet east of east end.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, JP

TIME SAMPLED: 15:00 DEPTH OF SAMPLE (feet): 0.5

SAMPLE DESCRIPTION/COMMENTS: Sandy gravel.

SAMPLING METHOD: Scoop and grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ________

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ________

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER		BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER		ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB					SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
EPH	✓				TSS		250 ml		---
VPH	✓				TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS082S12

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-SS08-2S15

RADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 240.5° to southwest corner of garage, 249° to northeast corner of garage, next to culvert at east end of site.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, SF

TIME SAMPLED: 14:50 DEPTH OF SAMPLE (feet): ______

SAMPLE DESCRIPTION/COMMENTS: Sandy gravel, wet, medium to coarse sand, 1/2 to 1 inch gravel, some organics, trace silt.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ■ Replicate of Soil Sample ID LAY-SS08-2S11

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)	✓	1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
VPH	✓			TSS		250 ml	---
EPH	✓			TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS082S15

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-SS08-SD01

RADAR STATION: Point Lay WEATHER: Overcast, very fine rain, 50°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 132 MAGNETIC HEADING: 24°

FIXED POINT: Northeast corner of module train.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, DN

TIME SAMPLED: 13:30 DEPTH OF SAMPLE (feet): 2

SAMPLE DESCRIPTION/COMMENTS: In pond with sheen. Same location as SW01.

SAMPLING METHOD: Grab - soil scoop

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
13:30	541 HS				

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES				TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-SS08-SD02

RADAR STATION: Point Lay WEATHER: Overcast, very fine rain, 50°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 50 MAGNETIC HEADING: 20°

FIXED POINT: Northeast corner of module train.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, DN

TIME SAMPLED: 14:00 DEPTH OF SAMPLE (feet): 2"

SAMPLE DESCRIPTION/COMMENTS: Marshy area, drainage from pond.

SAMPLING METHOD: Grab - soil scoop

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS08SD02

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-SS08-SD03

RADAR STATION: Point Lay WEATHER: Overcast, very fine rain, 50°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 213 MAGNETIC HEADING: 36.5°

FIXED POINT: Northeast corner of module train.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: AP, DN

TIME SAMPLED: 14:00 DEPTH OF SAMPLE (feet): 1"

SAMPLE DESCRIPTION/COMMENTS: At junction of drainages from pond. Same location as SW02.

SAMPLING METHOD: Grab - soil scoop

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109841303\SS08SD03

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS08-SW01

RADAR STATION: Point Lay WEATHER: Sunny, 48°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 132 MAGNETIC HEADING: 24°

FIXED POINT: Northeast corner of module train.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN

TIME SAMPLED: 11:00 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Sample was collected in a pond. A sheen is visible.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
11:00	7.1	580	10°C	1.000	

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES				TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS	✓	1 liter	---
VOC-BTEX 8020	✓			TDS	✓	250 ml	---
				TSS	✓	250 ml	---
				TOC	✓	500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet)
(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\SS08SW01

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-SS08-SW02

RADAR STATION: Point Lay WEATHER: Sunny, 48°F

SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 213 MAGNETIC HEADING: 36.5°

FIXED POINT: Northeast corner of module train.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JP, DN

TIME SAMPLED: 11:15 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: At junction of drainages from pond. Same location as SD03.

SAMPLING METHOD: Grab

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
11:15	7.3	520 μS	7°C		

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)		3 x 40 ml	4 oz
PCB	✓			SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOGS FOR BACKGROUND (BKGD)

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-BKGD-S01

RADAR STATION: Point Lay WEATHER: Overcast, slight breeze, 50°F

SITE/AOC: BKGD FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______

FIXED POINT: 222° to southeast corner of hangar, 276° to top of radome, 282° to southeast corner of main building train.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 14:40 DEPTH OF SAMPLE (feet): 0-0.5

SAMPLE DESCRIPTION/COMMENTS: Clayey silt, dark brown-brown, moderate organic material, firm, moist.

SAMPLING METHOD: Hand scoop

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES	✓			TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC	✓	500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-BKGD-S02
RADAR STATION: Point Lay WEATHER: Overcast, breezy, 50°F
SITE/AOC: BKGD FEET FROM FIXED POINT: ______ MAGNETIC HEADING: ______
FIXED POINT: 224° to southeast corner of hangar, 295° to top of radome, 299° to southeast corner of main building train.
SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: SS, RC
TIME SAMPLED: 15:10 DEPTH OF SAMPLE (feet): 0-0.5
SAMPLE DESCRIPTION/COMMENTS: Silty peat, brown, very moist.

SAMPLING METHOD: Hand scoop
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED									
ANALYSES	✓	BARROW LAB CONTAINERS			ANALYSES	✓	ANCHORAGE LAB CONTAINERS		
		WATER		SOIL			WATER		SOIL
TPH	✓	1 liter		8 oz	VOC (8260)	✓	3 x 40 ml		4 oz
PCB	✓				SVOC (8270)	✓	1 liter		8 oz
PESTICIDES	✓				TOTAL METALS	✓	1 liter		8 oz
HVOC 8010	✓	1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
					TSS		250 ml		---
					TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet)
(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-BKGD-S03

RADAR STATION: Point Lay WEATHER: Overcast, drizzly, 50°F

SITE/AOC: BKGD FEET FROM FIXED POINT: MAGNETIC HEADING:

FIXED POINT: 170° to southeast corner of hangar, 154° to top of radome, 150° to southwest corner of main building train.

SAMPLE MATRIX: ■ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 16:20 DEPTH OF SAMPLE (feet): 0-0.5

SAMPLE DESCRIPTION/COMMENTS: Silty peat, heavy organic material, brown - dark brown, very moist.

SAMPLING METHOD:

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED									
ANALYSES	✓	BARROW LAB CONTAINERS			ANALYSES	✓	ANCHORAGE LAB CONTAINERS		
		WATER		SOIL			WATER		SOIL
TPH	✓	1 liter		8 oz	VOC (8260)	✓	3 x 40 ml		4 oz
PCB	✓				SVOC (8270)	✓	1 liter		8 oz
PESTICIDES	✓				TOTAL METALS	✓	1 liter		8 oz
HVOC 8010	✓	1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
					TSS		250 ml		---
					TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-BKGD-SD01

RADAR STATION: Point Lay WEATHER: Overcast, drizzle, 45°F

SITE/AOC: BKGD FEET FROM FIXED POINT: ________ MAGNETIC HEADING: ________

FIXED POINT: 222° to southeast corner of hangar, 276° to top of radome, 280° to southeast corner of main building train.

SAMPLE MATRIX: ☐ Soil (S) ■ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC

TIME SAMPLED: 14:15 DEPTH OF SAMPLE (feet): ________

SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-BKGD-SW01. Gray-brown to brown silty clay, moderate organics, firm, saturated.

SAMPLING METHOD: Dedicated sample scoop

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ________

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ________

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

BG=0	MONITORING READINGS				
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES	✓			TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC	✓	500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-BKGD-SW01

RADAR STATION: Point Lay WEATHER: Overcast, 45°F

SITE/AOC: BKGD FEET FROM FIXED POINT: ____ MAGNETIC HEADING: ____

FIXED POINT: 222° to southeast corner of hanger, 276° to top of radome, 280° to southeast corner of main building train.

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: SS, RC, JP

TIME SAMPLED: 13:15 DEPTH OF SAMPLE (feet): ____

SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-BKGD-SD01.

SAMPLING METHOD: ____

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ■ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ____

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ____

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
13:03	6.4	150 µS	8°C		

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES	✓			TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS	✓	1 liter	---
VOC-BTEX 8020	✓			TDS	✓	250 ml	---
				TSS	✓	250 ml	---
				TOC	✓	500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\BKGDSW01

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-BKGD-SW02
RADAR STATION: Point Lay WEATHER: Overcast, 45°F
SITE/AOC: BKGD FEET FROM FIXED POINT: MAGNETIC HEADING:
FIXED POINT: 225° to southeast corner of hangar, 31° to top of radome, 313° to southeast corner of main building train.
SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ■ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: RC, JP
TIME SAMPLED: 11:15 DEPTH OF SAMPLE (feet):
SAMPLE DESCRIPTION/COMMENTS:

SAMPLING METHOD: Dedicated sample scoop
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY
11:01	8.2	170 μS	7°C		

BG=0 MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES	✓			TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS	✓	1 liter	---
VOC-BTEX 8020	✓			TDS	✓	250 ml	---
				TSS	✓	250 ml	---
				TOC	✓	500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet)
(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\BKGDSW02

SAMPLE COLLECTION LOGS FOR QA/QC

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-AB01

RADAR STATION: Point Lay WEATHER:

SITE/AOC: FEET FROM FIXED POINT: MAGNETIC HEADING:

FIXED POINT:

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: RC, JD

TIME SAMPLED: 13:46 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Ambient condition blank.

SAMPLING METHOD:

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

■ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED							
ANALYSES	✓	BARROW LAB CONTAINERS		ANALYSES	✓	ANCHORAGE LAB CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020				TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\AB01

SAMPLE COLLECTION LOG

DATE: ______________ SAMPLE ID: LAY-AB02

RADAR STATION: Point Lay WEATHER: ______________

SITE/AOC: ______________ FEET FROM FIXED POINT: ______________ MAGNETIC HEADING: ______________

FIXED POINT: ______________

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: ______________

TIME SAMPLED: ______________ DEPTH OF SAMPLE (feet): ______________

SAMPLE DESCRIPTION/COMMENTS: ______________

SAMPLING METHOD: ______________

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ______________

■ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ______________

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB				SVOC (8270)		1 liter	8 oz
PESTICIDES				TOTAL METALS		1 liter	8 oz
HVOC 8010		1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020				TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-EB01

RADAR STATION: Point Lay WEATHER:

SITE/AOC: Equipment Blank FEET FROM FIXED POINT: MAGNETIC HEADING:

FIXED POINT:

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: ASP

TIME SAMPLED: 13:45 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Equipment rinsate blank.

SAMPLING METHOD:

QA/QC SAMPLES COLLECTED: ■ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)					

✓ CHECK ANALYSES REQUESTED							
		BARROW LAB				ANCHORAGE LAB	
ANALYSES	✓	CONTAINERS		ANALYSES	✓	CONTAINERS	
		WATER	SOIL			WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES	✓			TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS		1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\EB01

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-EB02

RADAR STATION: Point Lay WEATHER:

SITE/AOC: FEET FROM FIXED POINT: MAGNETIC HEADING:

FIXED POINT:

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: JD

TIME SAMPLED: 13:50 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Dissolved metals taken with Baker D.I. through new micropore pre-filter.

SAMPLING METHOD: Equipment rinse with Baker analyzed D.I. for VOA and semi-VOA and lab analyzed D.I. for others.

QA/QC SAMPLES COLLECTED: ■ Equipment Blank (EB) ☐ QA/QC Extra Volumes

☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER	SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER	SOIL
TPH	✓	1 liter	8 oz	VOC (8260)	✓	3 x 40 ml	4 oz
PCB	✓			SVOC (8270)	✓	1 liter	8 oz
PESTICIDES				TOTAL METALS	✓	1 liter	8 oz
HVOC 8010	✓	1 x 40 ml	4 oz	DISS METALS	✓	1 liter	---
VOC-BTEX 8020	✓			TDS		250 ml	---
				TSS		250 ml	---
				TOC		500 ml	4 oz
				TCLP		2 liters	2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 09/07/93 SAMPLE ID: LAY-EB03
RADAR STATION: Point Lay WEATHER:
SITE/AOC: FEET FROM FIXED POINT: MAGNETIC HEADING:
FIXED POINT:
SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS:
TIME SAMPLED: DEPTH OF SAMPLE (feet):
SAMPLE DESCRIPTION/COMMENTS:

SAMPLING METHOD:
QA/QC SAMPLES COLLECTED: ■ Equipment Blank (EB) ☐ QA/QC Extra Volumes
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER		BARROW LAB CONTAINERS SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER		ANCHORAGE LAB CONTAINERS SOIL
TPH		1 liter		8 oz	VOC (8260)	✓	3 x 40 ml		4 oz
PCB					SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
VPH	✓				TSS		250 ml		---
EPH	✓				TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet)
(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\EB03

SAMPLE COLLECTION LOG

DATE: 08/23/93 SAMPLE ID: LAY-TB01

RADAR STATION: Point Lay WEATHER:

SITE/AOC: FEET FROM FIXED POINT: MAGNETIC HEADING:

FIXED POINT:

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: ICF KE

TIME SAMPLED: 10:00 DEPTH OF SAMPLE (feet):

SAMPLE DESCRIPTION/COMMENTS: Trip blank

SAMPLING METHOD: Blanks made by Friedman and Bruya in Barrow.

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

■ Trip Blank (TB) ☐ Duplicate of Water Sample ID

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS

TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS

TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED

ANALYSES	✓	BARROW LAB CONTAINERS WATER		SOIL	ANALYSES	✓	ANCHORAGE LAB CONTAINERS WATER		SOIL
TPH		1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB					SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010	✓	1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
					TSS		250 ml		---
					TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOG

DATE: 08/24/93 SAMPLE ID: LAY-TB02
RADAR STATION: Point Lay WEATHER:
SITE/AOC: Trip Blank FEET FROM FIXED POINT: MAGNETIC HEADING:
FIXED POINT:
SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)
SAMPLERS: ICF KE
TIME SAMPLED: 08:00 DEPTH OF SAMPLE (feet):
SAMPLE DESCRIPTION/COMMENTS:

SAMPLING METHOD:
QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes
■ Trip Blank (TB) ☐ Duplicate of Water Sample ID
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED									
ANALYSES	✓	BARROW LAB CONTAINERS			ANALYSES	✓	ANCHORAGE LAB CONTAINERS		
		WATER		SOIL			WATER		SOIL
TPH		1 liter		8 oz	VOC (8260)	✓	3 x 40 ml		4 oz
PCB					SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010	✓	1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020	✓				TDS		250 ml		---
					TSS		250 ml		---
					TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C
Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet)
(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)
Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ALASKA\4109641303\TB02

SAMPLE COLLECTION LOG

DATE: 08/25/93 SAMPLE ID: LAY-TB03

RADAR STATION: Point Lay WEATHER: ________

SITE/AOC: Point Lay FEET FROM FIXED POINT: ________ MAGNETIC HEADING: ________

FIXED POINT: ________

SAMPLE MATRIX: ☐ Soil (S) ☐ Sediment (SD) ☐ Surface Water (SW) ☐ Groundwater (GW)

SAMPLERS: ________

TIME SAMPLED: ________ DEPTH OF SAMPLE (feet): ________

SAMPLE DESCRIPTION/COMMENTS: ________

SAMPLING METHOD: ________

QA/QC SAMPLES COLLECTED: ☐ Equipment Blank (EB) ☐ QA/QC Extra Volumes

■ Trip Blank (TB) ☐ Duplicate of Water Sample ID ________

☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ________

WATER PARAMETERS					
TIME	PH	CONDUCTIVITY	TEMPERATURE	SPECIFIC GRAVITY	TURBIDITY

MONITORING READINGS					
TIME	PID READING (ppm)	CG/LEL (%)	HANBY SCREENING (standard/ppm)		

BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)

✓ CHECK ANALYSES REQUESTED									
ANALYSES	✓	BARROW LAB CONTAINERS			ANALYSES	✓	ANCHORAGE LAB CONTAINERS		
		WATER		SOIL			WATER		SOIL
TPH		1 liter		8 oz	VOC (8260)	✓	3 x 40 ml		4 oz
PCB					SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		---
VOC-BTEX 8020					TDS		250 ml		---
					TSS		250 ml		---
					TOC		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; Ice all samples to 4°C

Sample ID Format: Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

APPENDIX E

CHAIN-OF-CUSTODY FORMS

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO [redacted]0535

PROJ. NO.	PROJECT NAME		NO.
41096-412-01	DEW Line N/FS		

SAMPLERS: (Signature)

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	VOC 8020	SVOC	total metals	dissolved metals	TDS	TSS	TOC	REMARKS
Point Lay	8-23	1315		X	LAY-BKGD-SW01	8		6			1	1		QA/QC
Point Lay	8-23	1115		X	LAY-BKGD-SW02	4		2			1	1		

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
	8/23/93 1630			8/23/93 1700	Fed EX # 504140 6752
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	

Anchorage
ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO. 0536

PROJ. NO.	PROJECT NAME	NO.	YR MO
4196-412-01	DEW Line KI/FS		

SAMPLERS: (Signature) [signatures]

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOC 8260	SVOC	total metals	dissolved metals	TDS	TSS	TOC	REMARKS
Point Lay	8-23	1000		X	LAY-TB01	2	2							
↓	↓	1345		↓	LAY-EB01	6	3	2	1					
↓	↓	1315		↓	LAY-BKGD-SW01	16	9		2	2			3	QA/QC
↓	↓	1115		↓	LAY-BKGD-SW02	5	2		1	1			1	

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	8-23 / 16:30	[signature]	[signature]	8/23/93 1700	Fed Ex # 8040406471
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	

ICF KAISER ENGINEERS

Barrow

CHAIN OF CUSTODY RECORD

NO. 0537

YR	MO	NO.

PROJ. NO. A1096-412-01

PROJECT NAME DEW Line RI/FS

SAMPLERS: (Signature)

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	HVOC	VOC 8020	TPH	PCB	Pesticides	REMARKS
✓ Point Lay	8-23	1000		X	LAY-TBØ1 ✓	2	2 →					
✓ ↓	↓	1345		↓	LAY-EBØ1 ✓	4	3 →	1 →				
✓ ↓	↓	1315		↓	LAY-BKGD-SWØ1 ✓	12	9 →	3 →				WA I/OC
✓ ↓	↓	1115		↓	LAY-BKGD-SWØ2 ✓	4	3 →	1 →				
✓ ↓	↓	1330		↓	LAY-AOC5-SDØ1 ✓	2	1 →	1				possible high concentration
✓ ↓	↓	1400		↓	LAY-AOC5-SDØ2 ✓	2	1 →	1				
✓ ↓	↓	1350		↓	LAY-AOC5-SDØ3	2	1 →	1				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
	8-25 / 12:38			8-25 / 2000	
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
				8-25-93 / 1000	
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO. 0538

PROJ. NO.	PROJECT NAME	YR MO NO.
41096-4B-01	DEW Line RI/FS	

SAMPLERS: (Signature) [illegible signatures]

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	HVOC	VOC 8020	TPH	PCBs	Pesticides			REMARKS
✓ Point Lay	6-23	1255		X	LAY-AOC5-SO1 ✓	2	1	→	1	→	→			possible high concentration
✓		1155			LAY-AOC5-SO2 ✓	2	1	→	1	→				
✓		1140			LAY-AOC5-SO3 ✓	2	1	→	1	→				
✓		1130			LAY-AOC5-SO4 ✓	2	1	→	1	→				
✓		1115			LAY-AOC5-SO5 ✓	2	1	→	1	→				
✓		1315			LAY-AOC5-SO6 ✓	2	1	→	1	→				QA/QC possible high concentration
✓		1305			LAY-AOC5-SO7 ✓	2	1	→	1	→	→			possible high concentration
✓		~~1415~~			LAY-BKGD-SD01 ✓	2	1	→	1	→	→			time is 1415
✓		1440			LAY-BKGD-SO1 ✓	2	1	→	1	→	→			
✓		1510			LAY-BKGD-SO2 ✓	2	1	→	1	→	→			
✓		1620			LAY-BKGD-SO3 ✓	2	1	→	1	→	→			
✓		1600			LAY-BKGD-SO4 ✓	2	1	→	1	→	→			

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
P. Balonsky	[illegible]	[illegible signature]	[illegible signature]	[illegible]	
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
			[illegible signature]	[illegible]	
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO. 0539

YR	MO	NO.

PROJ. NO. 41091-412-01

PROJECT NAME DEW Line N/FS

SAMPLERS: (Signature) [illegible signature] [illegible signature]

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	VOC 8020	VOC	Total metals	Dissolved metals	TDS	TSS	TOC	REMARKS
Point Lay	3-25	1330		X	LAY-ACCS-SD1	3	1	1	1					possible high concentration
		1315			LAY-ACCS-SD6	3	1	1	1					QA/QC possible high concentration
		1415			LAY-BKGD SD01	4	1	1	1				1	
		1440			LAY-BKGD-SD1	4	1	1	1				1	
		1510			LAY-BKGD-SD2	3	1	1	1					
		1620			LAY-BKGD-SD3	3	1	1	1					
		1600			LAY-BKGD-SD4	4	1	1	1				1	

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[illegible signature]	3-25 10:30	[illegible signature]	[illegible signature]	3/26/93 1710	Fed Ex # 804/406763

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
		[illegible signature]	[illegible signature]		

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO. 0540

PROJ. NO.	PROJECT NAME	NO. YRMO
4106-412 U	DLW Line RI/FS	

SAMPLERS: (Signature) Robert C. [illegible]

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOC 8260	SVOC	[illegible]	[illegible] Metals	[illegible]	TSS	TOC	REMARKS
Huntley	8-24	0800		X	LAY TE02	2	2							
		1350			LAY-FR02	7	3	2	1	1				
		1346			LAY-AB01	3	3							
		1100			LAY-AC05-SW01	3	3							
		1252			LAY-AC04-SW02	7	3	2			1 →		1	
		1510			LAY-LF01-SW04		3							
		1515			LAY-LF01-SW08		3							
		1525			LAY-SS06-SW02		3							
					~~LAY-W01~~									NA
					~~LAY-A0~~									
		1520			LAY-LF01-SD08	4	1	1	1				1	

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Robert C. [illegible]	8/24/93 1700	[illegible]	[illegible]	8/24/93 1715	Fed Ex # 804406730
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO. 0541

PROJ. NO.	PROJECT NAME	NO. (YR MO)
4196-412-01	DEW Line [illegible]	

SAMPLERS: (Signature) [illegible signature]

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOC [illegible]	SVOC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	REMARKS
Point Lay	8-24	1100		X	LAY-ACC5-SW01 ✓	6		2	1	1	1 →		1	
		1150			LAY-SS06-S03 ✓	3	1	1	1					possible high [illegible]
		1505			LAY-SS06-S08 ✓	3	1	1	1					
		1515			LAY-LF01-SD04 ✓	4 [illegible]	1	1	1				1	QA/QC
					~~LAY-LF01-SD08~~	~~4 [illegible]~~								Sed NA
					LAY-ACC4-SD02 ✓	2	1	1						
		1525			LAY-SS06-SW02 ✓	2		2						

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	8/24/93 1700	[signature]	[signature]	8/24/93 1715	Fed EX # 8041406726
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO. 0542

PROJ. NO.	PROJECT NAME					NO. OF CON-TAINERS	[illegible]	[illegible]	PCB	TPH	[illegible]			REMARKS
41096-412-01	FEW Line N/FS													NO. YR MO
SAMPLERS: (Signature)														
STAT. NO.	**DATE 1993**	**TIME**	**COMP.**	**GRAB**	**STATION LOCATION**									
Point Lay	8-24	1320		X	LAY-ACC4-SD01 ✓	2		1		1→				
		1300			LAY-AOC4-SD02 ✓	2		1		1				
		1145			LAY-AOC4-SD03 ✓	2		1		1				
		1315	f		LAY-AOC4-SD04 ✓	2		1		1				time is 1315
		1120			LAY-SS06-S01	2	1→		1→					possible high concentration
		1125			LAY-SS06-S02 ✓	2	1→		1→					possible high concentration
		1150			LAY-SS06-S03 ✓	2	1→		1→					possible high concentration
		1250			LAY-SS06-S04 ✓	2	1→		1→					
		1305			LAY-SS06-S05 ✓	2	1→		1→					
		1315			LAY-SS06-S06 ✓	2	1→		1→					QA/QC
		1434			LAY-SS06-S07 ✓	2	1→		1→					
		1505			LAY-SS06-S08 ✓	2	1→		1→					
		1120			LAY-SS06-S09 ✓	2	1→		1→					possible high concentration
		1438			LAY-SS06-S10 ✓	2	1→		1→					
		1515			LAY-SS06-S11 ✓	2	1→		1→					

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	8-24-93 1720	[signature]	[signature]		
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO 0543

YR MO NO.

PROJ. NO. 41U6-412-01

PROJECT NAME: DEW Line KI/FS

SAMPLERS: (Signature) [signature]

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	VOC	[illegible]	PCB	TPH	Pesticides			REMARKS
Point Lay	8-24	0800		X	LAY-TB02	2	2→							
		1350			LAY-EB02	4 3	3→							# containers 3
		1100			LAY-ACC5-SW01	4	3→	1→						
		1115			LAY-ACC5-SW02	4	3→	1→						
		1320			LAY-ACC4-SW01	3	3→							
		1252			LAY-ACC4-SW02	3	3→		1					
		1145			LAY-ACC4-SW03	3	3→		1					
		~~1430~~ 1600			LAY-LF01-SW01	3	3→							1600
		1610			LAY-LF01-SW02	3	3→							
		~~1430~~ 1430			LAY-LF01-SW03	3	3→							
		1510			LAY-LF01-SW04		3→							
		1500			LAY-LF01-SW05	3	3→							
		1445			LAY-LF01-SW06	3	3→							time is 1445
		1410			LAY-LF01-SW07	3	3→							
		1515			LAY-LF01-SW08	3	3→							
		1420			LAY-SS06-SW01	3	3→							1420

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	8-24 1720	[signature]	[signature]		
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO. 0544

PROJ. NO.	PROJECT NAME	NO. OF CONTAINERS							REMARKS	NO. / YR MO
41096-412-01	DEW Line KI/FS									

SAMPLERS: (Signature)

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS
Point Lay	8-24	1525		X	LAY-SS06-SW02	3	3 →						
↓	↓	1420		↓	LAY-SS06-SW03	3	3	3					VOC 8020 only
↓	↓	1600		↓	LAY-SS06-SW04	3	3	3					VOC 8020 only

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
	8-24-93 1700				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO. [illegible]545

PROJ. NO.	PROJECT NAME					NO.	YR	MO
A1046-412-01	DEW Line RI/FS							

SAMPLERS: (Signature) [illegible]

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	TVOC	VOC	PCE	[illegible]	[illegible]			REMARKS
Point Lay	8-24	1350		X	LAY-EB02				1	1 →				
		1320			LAY-ACC4-SW01					1				
		1420			LAY-LF01-SW01	1			1 →					
		1610			LAY-LF01-SW02	1			1 →					
		1430			LAY-LF01-SW03	1			1 →					
		1510			LAY-LF01-SW04	1			1 →					
		1500			LAY-LF01-SW05				1 →					
		1445			LAY-LF01-SW06	1			1 →					
		1440			LAY-LF01-SW07				1 →					
		1518			LAY-LF01-SW08	1			1 →					
		~~1420~~			~~LAY-SS06-SW01~~									NA
		1525			LAY-SS06-SW02	1			1	1				
		~~1420~~			~~LAY-SS06-SW03~~									NA
	↓	~~1600~~		↓	~~LAY-SS06-SW04~~	1			1	1				NA

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	8-24-93 1712	[signature]	[signature]		
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	
			[illegible]		

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO. 0546

PROJ. NO.	PROJECT NAME
4106-412-01	DEW Line RI/FS

SAMPLERS: (Signature) [illegible]

NO.	YR	MO				

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	VOC	SVOC	PCB	TPH	Metals		REMARKS
Point Lay	8-24	1430		X	LAY-SS01-SD01		1→	1→					
		1540			LAY-SS01-SD02		1→	1→					
		1334			LAY-SS01-SD03	2	1→	1→					
		1605			LAY-SS01-SD04		1→	1→					
		1620			LAY-LF01-SD01	2	1→	1→					
		1615			LAY-LF01-SD02	2	1→	1→					
		1600			LAY-LF01-SD03	2	1→	1→					
		1515			LAY-LF01-SD04	2	1→	1→					
		1505			LAY-LF01-SD05	2	1→	1→					
		1450			LAY-LF01-SD06	2	1→	1→					
		1442			LAY-LF01-SD07	2	1→	1→					
		1520			LAY-LF01-SD08	2	1→	1→					
		1550			LAY-LF01-SD09	2	1→	1→					
		1540			LAY-LF01-SD10	2	1→	1→					
		1430			LAY-LF01-SD11	2	1→	1→					
		1600			LAY-SS06-SD04	1							

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[illegible]	8-24-93 1725	[illegible]	[illegible]		
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO. 0547

YR MO NO.

PROJ. NO. 4106-4112 01

PROJECT NAME: DEW Line KI/FS

SAMPLERS: (Signature) [signature]

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOC 8260	SVOC	total metals	dissolved metals	TDS	TSS	TOC	REMARKS
Point Lay	8 21	1510		X	LAY-LF01-SW004	6	2	1	1	1 →	→	1		
↓	↓	1515		↓	LAY-LF01-SW008	6	2	1	1	1 →	→	1		
↓	↓	1525		↓	LAY-SS06-SW042	2		1	1					

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	8.24.93 1715	[signature]	[signature]	[illegible]	FedEx # 6041406715
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO. 0548

PROJ. NO.	PROJECT NAME	NO. OF CON-TAINERS	TPH							REMARKS	YR MO NO.
4106412-01	DEW Line KI/FS										

SAMPLERS: (Signature)

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	TPH							REMARKS
Point Lay	8-24	1420		X	LAY-SS06- 3 ✓	1	1							
"	8-24	1420		X	LAY-SS06- 1 ✓	1	1							

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
	8 26 93 / 1715				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	

Anchorage

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

NO. [illegible]0587

PROJ. NO.	PROJECT NAME	YR MO NO.
A1096-412-01	DEW Line RI/FS	

SAMPLERS: (Signature) [signature], Robert ...

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	BTEX	VPH	8260	EPH	8270			REMARKS
Point Lay	9-7	1435		X	LAY-AOC5-2SØ8 ✓	2		1→		1→				QA/QC
↓	↓	1440		↓	LAY-AOC5-2SØ9 ✓	2		1→		1→				
		1445			LAY-AOC5-2S1Ø ✓	2	1→			1				
		1445			LAY-AOC5-2S11 ✓	2	1→			1				
		1500			LAY-AOC5-2S12 ✓	2	1→			1				
		1450			LAY-AOC5-2S15 ✓	2		1→		1→				
		1515			LAY-SSØ6-2SDØ5 ✓	2	1→			1				
		1525			LAY-SSØ6-2SDØ6 ✓	2	1→			1				
		1535			LAY-SSØ6-2SDØ7 ✓	2		1→		1→				
		1520			LAY-SSØ6-2S12 ✓	2		1→		1→				
		1513			LAY-SSØ6-2S13 ✓	2	1→			1				
		1530			LAY-SSØ6-2S14 ✓	2	1→			1				
		1540			LAY-SSØ6-2S15 ✓	2	1→			1				
		1550			LAY-SSØ6-2S16 ✓	2	1→			1				
↓	↓	1555		↓	LAY-SSØ6-2S18 ✓	2	1→			1				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9-8-93 1533	[signature]	[signature]		
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:
		[signature]	9/9/93 1315	

ICF KAISER ENGINEERS Anchorage

CHAIN OF CUSTODY RECORD

NO. 0585

PROJ. NO. A106-412-01 | PROJECT NAME DEW Line RI/FS | NO. [ ] YR MO

SAMPLERS: (Signature) R. L.

STAT. NO.	DATE 1993	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	VPH	5260	EPH					REMARKS
Point Lay	9-7	1600		X	LAY-AOC4-2SW04	6	2	3	1					QA/QC
		1720			LAY-AOC4-2SW05	6	2	3	1					
		1730			LAY-AOC4-2SW06	6	2	3	1					
		1725			LAY-AOC4-2SD05	2	1	→	1					
		1735			LAY-AOC4 2SD06	2	1	→	1					
		1600			LAY-AOC4 2SD07	2	1	→	1					
		1730			LAY-LF01-2SW09	6	2	3	1					
		1745			LAY-LF01-2SW10	6	2	3	1					
		1720			LAY-LF01-2SD12	2	1	→	1					
		1745			LAY-LF01-2SD13	2	1	→	1					
		1800			LAY-LF01-2SD14	2	1	→	1					
		1000			LAY-TB03	2		2						
		1800			LAY-EB03	3		3						

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9-8-93 1523	[signature]	[signature]		
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	
		[signature]	9/9/93 1315		

APPENDIX F

ANALYTICAL DATA

1. SUMMARY TABLES OF ANALYTICAL DATA (presented in Sections 3.0 and 4.0)
2. CROSS-REFERENCE TABLE FOR SAMPLE IDENTIFICATION
3. ANALYTICAL DATA (for each site CT&E Data is presented first followed by F&B Data)

1. **SUMMARY TABLES OF ANALYTICAL DATA (presented in Sections 3.0 and 4.0)**

2. CROSS-REFERENCE TABLE FOR SAMPLE IDENTIFICATION

CROSS-REFERENCE SAMPLE IDENTIFICATION

RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION	FIELD CHAIN-OF-CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	FIELD BATCH IDENTIFICATION		LABORATORY IDENTIFICATION		LABORATORY BATCH IDENTIFICATION		SAMPLE DESCRIPTION
			CT&E	F&B	CT&E	F&B	CT&E	F&B	
Deactivated Landfill (LF01)									
LAY-LF01-SD01	LAY-LF01-SD01	LF01		546		478		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-LF01-SD02	LAY-LF01-SD02	LF01		546		480		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-LF01-SD03	LAY-LF01-SD03	LF01		546		482		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-LF01-SD04	LAY-LF01-SD04	LF01	541	546	93.4354-6	484	93.4354	#5-08/25/93 #1&2-08/25/93	Sediment
LAY-LF01-SD04	LAY-LF01-SD04DP	LF01	541		93.4354-8		93.4354		Sediment Duplicate
LAY-LF01-SD04	LAY-LF01-SD04S	LF01	541		93.4354-7		93.4354		Sediment Spike
LAY-LF01-SD04	LAY-LF01-SD04SD	LF01	541		93.4354-12		93.4354		Sediment Spike Duplicate
LAY-LF01-SD05	LAY-LF01-SD05	LF01		546		486		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-LF01-SD06	LAY-LF01-SD06	LF01		546		488		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-LF01-SD07	LAY-LF01-SD07	LF01		546		490		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-LF01-SD08	LAY-LF01-SD08	LF01	540	546	93.4356-13	492	93.4656	#5-08/25/93 #1&2-08/25/93	Sediment
LAY-LF01-SD08	LAY-LF01-SD08DP	LF01	540		93.4356-15		93.4356		Sediment Duplicate
LAY-LF01-SD08	LAY-LF01-SD08S	LF01	540		93.4356-14		93.4356		Sediment Spike

CT&E Commercial Testing and Engineering Co.
F&B Friedman and Bruya, Inc.

CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION	FIELD CHAIN-OF-CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	FIELD BATCH IDENTIFICATION		LABORATORY IDENTIFICATION		LABORATORY BATCH IDENTIFICATION		SAMPLE DESCRIPTION
			CT&E	F&B	CT&E	F&B	CT&E	F&B	
Deactivated Landfill (LF01) (Continued)									
LAY-LF01-SD09	LAY-LF01-SD09	LF01		546		494		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-LF01-SD10	LAY-LF01-SD10	LF01		546		496		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-LF01-SD11	LAY-LF01-SD11	LF01		546		498		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-LF01-2SD12	LAY-LF01-2SD12	LF01	585		93.4692-11		93.4692		Sediment
LAY-LF01-2SD13	LAY-LF01-2SD13	LF01	585		93.4692-12		93.4692		Sediment
LAY-LF01-2SD14	LAY-LF01-2SD14	LF01	585		93.4692-15		93.4692		Sediment
LAY-LF01-2SD13	LAY-LF01-2SD13S	LF01	585		93.4692-13		93.4692		Sediment Spike
LAY-LF01-2SD13	LAY-LF01-2SD13SD	LF01	585		93.4692-14		93.4692		Sediment Spike Duplicate
LAY-LF01-SW01	LAY-LF01-SW01	LF01		543 545		559 592		#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-LF01-SW02	LAY-LF01-SW02	LF01		543 545		560 597		#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-LF01-SW03	LAY-LF01-SW03	LF01		543 545		561 598		#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-LF01-SW04	LAY-LF01-SW04	LF01	540 547	543 545	93.4358-1 93.4656-10	562 601	93.4358 93.4356	#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-LF01-SW04	LAY-LF01-SW04DP	LF01	547		93.4358-3		93.4358		Surface Water Duplicate
LAY-LF01-SW04	LAY-LF01-SW04S	LF01	547		93.4358-2		93.4358		Surface Water Spike

CT&E Commercial Testing and Engineering Co.
F&B Friedman and Bruya, Inc.

CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION	FIELD CHAIN-OF-CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	FIELD BATCH IDENTIFICATION		LABORATORY IDENTIFICATION		LABORATORY BATCH IDENTIFICATION		SAMPLE DESCRIPTION
			CT&E	F&B	CT&E	F&B	CT&E	F&B	
Deactivated Landfill (LF01) (Continued)									
LAY-LF01-SW04	LAY-LF01-SW04SD	LF01	547		93.4358-6		93.4358		Surface Water Spike Duplicate
LAY-LF01-SW05	LAY-LF01-SW05	LF01		543 545		563 604		#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-LF01-SW06	LAY-LF01-SW06	LF01		543 545		564 609		#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-LF01-SW07	LAY-LF01-SW07	LF01		543 545		565 612		#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-LF01-SW08	LAY-LF01-SW08	LF01	540 547	543 545	93.4356-11	566 613	93.4356	#5-08/27/93 #3&4-08/27/93	Surface Water
LAY-LF01-2SW09	LAY-LF01-2SW09	LF01	585		93.4692-9		93.4692		Surface Water
LAY-LF01-2SW10	LAY-LF01-2SW10	LF01	585		93.4692-10		93.4692		Surface Water

CT&E Commercial Testing and Engineering Co.
F&B Friedman and Bruya, Inc.

CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION	FIELD CHAIN-OF-CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	FIELD BATCH IDENTIFICATION		LABORATORY IDENTIFICATION		LABORATORY BATCH IDENTIFICATION		SAMPLE DESCRIPTION
			CT&E	F&B	CT&E	F&B	CT&E	F&B	
Garage (SS06)									
LAY-SS06-S01	LAY-SS06-S01	SS06		542		636		#5-08/25/93 #1&2-08/25/93	Soil
LAY-SS06-S02	LAY-SS06-S02	SS06		542		638		#5-08/25/93 #1&2-08/25/93	Soil
LAY-SS06-S03	LAY-SS06-S03	SS06	541	542	93.4354-4	640	93.4354	#5-08/25/93 #1&2-08/25/93	Soil
LAY-SS06-S04	LAY-SS06-S04	SS06		542		642		#5-08/25/93 #1&2-08/25/93	Soil
LAY-SS06-S05	LAY-SS06-S05	SS06		542		644		#5-08/25/93 #1&2-08/25/93	Soil
LAY-SS06-S06	LAY-SS06-S06	SS06		542		646		#5-08/25/93 #1&2-08/25/93	Soil
LAY-SS06-S07	LAY-SS06-S07	SS06		542		648		#5-08/25/93 #1&2-08/25/93	Soil
LAY-SS06-S07	LAY-SS06-S07S	SS06		542		648		#5-08/25/93 #1&2-08/25/93	Soil Spike
LAY-SS06-S07	LAY-SS06-S07SD	SS06		542		648		#5-08/25/93 #1&2-08/25/93	Soil Spike Duplicate
LAY-SS06-S08	LAY-SS06-S08	SS06	541	542	93.4354-5	650	93.4354	#5-08/25/93 #1&2-08/25/93	Soil
LAY-SS06-S09	LAY-SS06-S09	SS06		542		652		#5-08/25/93 #1&2-08/25/93	Soil
LAY-SS06-S10	LAY-SS06-S10	SS06		542		654		#5-08/25/93 #1&2-08/25/93	Soil

CT&E Commercial Testing and Engineering Co.
F&B Friedman and Bruya, Inc.

CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION	FIELD CHAIN-OF-CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	FIELD BATCH IDENTIFICATION		LABORATORY IDENTIFICATION		LABORATORY BATCH IDENTIFICATION		SAMPLE DESCRIPTION
			CT&E	F&B	CT&E	F&B	CT&E	F&B	
Garage (SS06) (Continued)									
LAY-SS06-S11	LAY-SS06-S11	SS06		542		656		#5-08/25/93 #1&2-08/25/93	Soil
LAY-SS06-2S12	LAY-SS06-2S12	SS06	587		93.4693-14		93.4693		Soil
LAY-SS06-2S13	LAY-SS06-2S13	SS06	587		93.4693-15		93.4693		Soil
LAY-SS06-2S14	LAY-SS06-2S14	SS06	587		93.4693-16		93.4693		Soil
LAY-SS06-2S15	LAY-SS06-2S15	SS06	587		93.4693-17		93.4693		Soil
LAY-SS06-2S16	LAY-SS06-2S16	SS06	587		93.4693-18		93.4693		Soil
LAY-SS06-2S18	LAY-SS06-2S18	SS06	587		93.4693-19		93.4693		Soil
LAY-SS06-SD01	LAY-SS06-SD01	SS06		546		470		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-SS06-SD01	LAY-SS06-SD01DP	SS06		546		470		#5-08/25/93 #1&2-08/25/93	Sediment Duplicate
LAY-SS06-SD01	LAY-SS06-SD01S	SS06		546		470		#5-08/25/93 #1&2-08/25/93	Sediment Spike
LAY-SS06-SD01	LAY-SS06-SD01SD	SS06		546		470		#5-08/25/93 #1&2-08/25/93	Sediment Spike Duplicate
LAY-SS06-SD02	LAY-SS06-SD02	SS06		546		472		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-SS06-SD03	LAY-SS06-SD03	SS06		546		474		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-SS06-SD04	LAY-SS06-SD04	SS06		546		476		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-SS06-2SD05	LAY-SS06-2SD05	SS06	587		93.4693-11		93.4693		Sediment

CT&E Commercial Testing and Engineering Co.
F&B Friedman and Bruya, Inc.

CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION	FIELD CHAIN-OF-CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	FIELD BATCH IDENTIFICATION		LABORATORY IDENTIFICATION		LABORATORY BATCH IDENTIFICATION		SAMPLE DESCRIPTION
			CT&E	F&B	CT&E	F&B	CT&E	F&B	
Garage (SS06) (Continued)									
LAY-SS06-2SD06	LAY-SS06-2SD06	SS06	587		93.4693-12		93.4693		Sediment
LAY-SS06-2SD07	LAY-SS06-2SD07	SS06			93.4693-13		93.4693		Sediment
LAY-SS06-SW01	LAY-SS06-SW01	SS06		543		501 619		#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-SS06-SW02	LAY-SS06-SW02	SS06	540 541 547	544	93.4354-10 93.4356-12 93.4358-5	567 622	93.4354 93.4356 93.4358	#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-SS06-SW03	LAY-SS06-SW03	SS06		544		500 626		#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-SS06-SW04	LAY-SS06-SW04	SS06		544		499 616		#5-08/27/93 #3&4-08/25/93	Surface Water

CT&E Commercial Testing and Engineering Co.
F&B Friedman and Bruya, Inc.

CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION	FIELD CHAIN-OF-CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	FIELD BATCH IDENTIFICATION		LABORATORY IDENTIFICATION		LABORATORY BATCH IDENTIFICATION		SAMPLE DESCRIPTION
			CT&E	F&B	CT&E	F&B	CT&E	F&B	
Drainage Pathways from POL Tanks (SS07									
LAY-AOC4-SD01	LAY-SS07-SD01	SS07		542		628		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-AOC4-SD02	LAY-SS07-SD02	SS07	541	542	93.4354-9	630	93.4354	#5-08/25/93 #1&2-08/25/93	Sediment
LAY-AOC4-SD03	LAY-SS07-SD03	SS07		542		632		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-AOC4-SD04	LAY-SS07-SD04	SS07		542		634		#5-08/25/93 #1&2-08/25/93	Sediment
LAY-AOC4-2SD05	LAY-SS07-2SD05	SS07	585		93.4354-6		93.4354		Sediment
LAY-AOC4-2SD06	LAY-SS07-2SD06	SS07	585		93.4354-7		93.4354		Sediment
LAY-AOC4-2SD07	LAY-SS07-2SD07	SS07	585		93.4354-8		93.4354		Sediment
LAY-AOC4-SW01	LAY-SS07-SW01	SS07		543 545		558 582		#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-AOC4-SW02	LAY-SS07-SW02	SS07	540	543	93.4356-7	584 586	93.4356	#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-AOC4-SW03	LAY-SS07-SW03	SS07		543		588 589		#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-AOC4-2SW04	LAY-SS07-2SW04	SS07	585		93.4692-1		93.4692		Surface Water
LAY-AOC4-2SW04	LAY-SS07-2SW04S	SS07	585		93.4692-2		93.4692		Surface Water Spike
LAY-AOC4-2SW04	LAY-SS07-2SW04SD	SS07	585		93.4692-3		93.4692		Surface Water Spike
LAY-AOC4-2SW05	LAY-SS07-2SW05	SS07	585		93.4692-4		93.4692		Surface Water
LAY-AOC4-2SW06	LAY-SS07-2SW06	SS07	585		93.4692-5		93.4692		Surface Water

CT&E Commercial Testing and Engineering Co.
F&B Friedman and Bruya, Inc.

CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION	FIELD CHAIN-OF-CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	FIELD BATCH IDENTIFICATION		LABORATORY IDENTIFICATION		LABORATORY BATCH IDENTIFICATION		SAMPLE DESCRIPTION
			CT&E	F&B	CT&E	F&B	CT&E	F&B	
Crushed Drum Area (SS08)									
LAY-AOC5-S01	LAY-SS08-S01	SS08		538		417		#5-08/24/93 #1&2-08/24/93	Soil
LAY-AOC5-S02	LAY-SS08-S02	SS08		538		419		#5-08/24/93 #3&4-08/27/93	Soil
LAY-AOC5-S03	LAY-SS08-S03	SS08		538		421		#5-08/24/93 #3&4-08/27/93	Soil
LAY-AOC5-S04	LAY-SS08-S04	SS08		538		423		#5-08/24/93 #3&4-08/27/93	Soil
LAY-AOC5-S05	LAY-SS08-S05	SS08		538		425		#5-08/24/93 #3&4-08/27/93	Soil
LAY-AOC5-S06	LAY-SS08-S06	SS08	539	538	93.4327-2	427	93.4327	#5-08/24/93 #1&2-08/24/93	Soil
LAY-AOC5-S06	LAY-SS08-S06DP	SS08	539	538	93.4327-4	427	93.4327	#5-08/24/93 #1&2-08/24/93	Soil Duplicate
LAY-AOC5-S06	LAY-SS08-S06S	SS08	539	538	93.4327-3	427	93.4327	#5-08/24/93 #1&2-08/24/93	Soil Spike
LAY-AOC5-S06	LAY-SS08-S06SD	SS08	539	538	93.4327-10	427	93.4327	#5-08/24/93 #1&2-08/24/93	Soil Spike Duplicate
LAY-AOC5-S07	LAY-SS08-S07	SS08		538		429		#5-08/24/93 #1&2-08/24/93	Soil
LAY-AOC5-2S08	LAY-SS08-2S08	SS08	587		93.4693-1		93.4693		Soil
LAY-AOC5-2S08	LAY-SS08-2S08S	SS08	587		93.4693-2		93.4693		Soil Spike
LAY-AOC5-2S08	LAY-SS08-2S08SD	SS08	587		93.4693-3		93.4693		Soil Spike Duplicate

CT&E Commercial Testing and Engineering Co.
F&B Friedman and Bruya, Inc.

CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION	FIELD CHAIN-OF-CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	FIELD BATCH IDENTIFICATION		LABORATORY IDENTIFICATION		LABORATORY BATCH IDENTIFICATION		SAMPLE DESCRIPTION
			CT&E	F&B	CT&E	F&B	CT&E	F&B	
Crushed Drum Area (SS08) (Continued)									
LAY-AOC5-2S09	LAY-SS08-2S09	SS08	587		93.4693-4		93.4693		Soil
LAY-AOC5-2S10	LAY-SS08-2S10	SS08	587		93.4693-5		93.4693		Soil
LAY-AOC5-2S10	LAY-SS08-2S10S	SS08	587		93.4693-6		93.4693		Soil Spike
LAY-AOC5-2S10	LAY-SS08-2S10SD	SS08	587		93.4693-7		93.4693		Soil Spike Duplicate
LAY-AOC5-2S11	LAY-SS08-2S11	SS08	587		93.4693-8		93.4693		Soil
LAY-AOC5-2S12	LAY-SS08-2S12	SS08	587		93.4693-9		93.4693		Soil
LAY-AOC5-2S15	LAY-SS08-2S15	SS08	587		93.4693-10		93.4693		Soil
LAY-AOC5-SD01	LAY-SS08-SD01	SS08	539	537	93.4327-1	463	93.4327	#5-08/25/93 #1&2-08/24/93	Sediment
LAY-AOC5-SD02	LAY-SS08-SD02	SS08		537		465		#5-08/25/93 #1&2-08/24/93	Sediment
LAY-AOC5-SD03	LAY-SS08-SD03	SS08		537		467		#5-08/25/93 #3&4-08/27/93	Sediment
LAY-AOC5-SW01	LAY-SS08-SW01	SS08	540 541	543	93.4356-6 93.4354-1	573 576	93.4356 93.4354	#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-AOC5-SW01	LAY-SS08-SW01DP	SS08	541		93.4354-3		93.4354		Surface Water Duplicate
LAY-AOC5-SW01	LAY-SS08-SW01S	SS08	541		93.4354-2		93.4354		Surface Water Spike
LAY-AOC5-SW01	LAY-SS08-SW01SD	SS08	541		93.4354-11		93.4354		Surface Water Spike Duplicate

CT&E Commercial Testing and Engineering Co.
F&B Friedman and Bruya, Inc.

CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION	FIELD CHAIN-OF-CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	FIELD BATCH IDENTIFICATION		LABORATORY IDENTIFICATION		LABORATORY BATCH IDENTIFICATION		SAMPLE DESCRIPTION
			CT&E	F&B	CT&E	F&B	CT&E	F&B	
Crushed Drum Area (SS08) (Continued)									
LAY-AOC5-SW02	LAY-SS08-SW02	SS08		543		577 578		#5-08/27/93 #3&4-08/25/93	Surface Water

CT&E Commercial Testing and Engineering Co.
F&B Friedman and Bruya, Inc.

CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION	FIELD CHAIN-OF-CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	FIELD BATCH IDENTIFICATION		LABORATORY IDENTIFICATION		LABORATORY BATCH IDENTIFICATION		SAMPLE DESCRIPTION
			CT&E	F&B	CT&E	F&B	CT&E	F&B	
Background (BKGD)									
LAY-BKGD-S01	LAY-BKGD-S01	BKGD	539	538	93.4327-6	433	93.4327	#5-08/24/93 #1&2-08/24/93	Soil
LAY-BKGD-S02	LAY-BKGD-S02	BKGD	539	538	93.4327-7	435	93.4327	#5-08/24/93 #1&2-08/24/93	Soil
LAY-BKGD-S03	LAY-BKGD-S03	BKGD	539	538	93.4327-8	437	93.4327	#5-08/24/93 #1&2-08/24/93	Soil
LAY-BKGD-S04	LAY-BKGD-S04	BKGD	539	538	93.4327-9	439	93.4327	#5-08/24/93 #1&2-08/24/93	Soil
LAY-BKGD-SD01	LAY-BKGD-SD01	BKGD	539	538	93.4327-5	431	93.4327	#5-08/24/93 #3&4-08/27/93	Sediment
LAY-BKGD-SW01	LAY-BKGD-SW01	BKGD	535 536	537	93.4328-5 93.4329-1	448 457	93.4328 93.4329	#5-08/25/93 #3&4-08/24/93	Surface Water
LAY-BKGD-SW01	LAY-BKGD-SW01DP	BKGD	536		93.4328-7		93.4328		Surface Water Duplicate
LAY-BKGD-SW01	LAY-BKGD-SW01S	BKGD	535 536		93.4329-2		93.4329		Surface Water Spike
LAY-BKGD-SW01	LAY-BKGD-SW01SD	BKGD	535		93.4329-3		93.4329		Surface Water Spike Duplicate
LAY-BKGD-SW02	LAY-BKGD-SW02	BKGD	535 536	537	93.4328-8 93.4329-4	461 462	93.4328 93.4329	#5-08/25/93 #3&4-08/24/93	Surface Water

CT&E Commercial Testing and Engineering Co.
F&B Friedman and Bruya, Inc.

CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION	FIELD CHAIN-OF-CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	FIELD BATCH IDENTIFICATION		LABORATORY IDENTIFICATION		LABORATORY BATCH IDENTIFICATION		SAMPLE DESCRIPTION
			CT&E	F&B	CT&E	F&B	CT&E	F&B	
Quality Assurance Samples									
LAY-AB01	LAY-AB01	QA/QC	540		93.4356-5		93.4356		Ambient Blank
LAY-EB01	LAY-EB01	QA/QC	536	537	93.4328-2	443 446	93.4328	#5-08/25/93 #3&4-08/24/93	Equipment Blank
LAY-EB01	LAY-EB01S	QA/QC	536		93.4328-3		93.4328		Equipment Blank Spike
LAY-EB01	LAY-EB01SD	QA/QC	536		93.4328-4		93.4328		Equipment Blank Spike Duplicate
LAY-EB02	LAY-EB02	QA/QC	540	543 545	93.4356-2	557 572	93.4356	#5-08/27/93 #3&4-08/25/93	Equipment Blank
LAY-EB02	LAY-EB02DP	QA/QC	540		93.4356-4		93.4356		Equipment Blank Duplicate
LAY-EB02	LAY-EB02S	QA/QC	540		93.4356-3		93.4356		Equipment Blank Spike
LAY-EB02	LAY-EB02SD	QA/QC	540		93.4356-16		93.4356		Equipment Blank Spike Duplicate
LAY-EB03	LAY-EB03	QA/QC	585		93.4692-17		93.4692		Equipment Blank
LAY-TB01	LAY-TB01	QA/QC	536	537	93.4328-1	441	93.4328	#3&4-08/24/93	Trip Blank
LAY-TB02	LAY-TB02	QA/QC	540	543	93.4356-1	569	93.4356	#3&4-08/25/93	Trip Blank
LAY-TB03	LAY-TB03	QA/QC	585		93.4692-16		93.4692		Trip Blank

CT&E Commercial Testing and Engineering Co.
F&B Friedman and Bruya, Inc.

3. ANALYTICAL DATA

ANALYTICAL DATA SHEETS FOR THE DEACTIVATED LANDFILL (LF01)

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-6
Client Sample ID :LAY-LF01-SD04 POINT LAY
Matrix :SOIL

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70106
Ordered By	:RAY MORRIS	Report Completed	:10/07/93
Project Name	:DEW LINE RI/FS	Collected	:08/24/93 @ 15:15 hrs
Project#	:41096-412-01	Received	:08/26/93 @ 12:00 hrs
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	: Steph C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

Qualifier/Comments

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.050	U	mg/Kg	EPA 8260 (J)-A.1		08/26	09/13	KWM
Bromobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromochloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromodichloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromoform	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromomethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
n-Butylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
sec-Butylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
tert-Butylbenzne	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Carbon Tetrachloride	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloroethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloroform	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
2-Chlorotoluene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
4-Chlorotoluene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromochloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
12Dibromo3Chloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dibromoethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromomethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,4-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dichlorodifluoromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloroethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
cis-1,2-Dichloroethene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
trans1,2-Dichloroethene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
2,2-Dichloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloropropene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Ethylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Hexachlorobutadiene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Isopropylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
p-Isopropyltoluene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM

CS 2-2-94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-6
Client Sample ID :LAY-LF01-SD04 POINT LAY
Matrix :SOIL

Qualifier/Comments

Methylene Chloride	0.050	U	mg/Kg	EPA 8260 (J)-A.1	08/26	09/13	KWM
Napthalene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
n-Propylbenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Styrene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1112-Tetrachloroethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1122-Tetrachloroethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Tetrachloroethene	0.306		mg/Kg	EPA 8260	08/26	09/13	KWM
Toluene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,3-Trichlorobenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,4-Trichlorobenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,1,1-Trichloroethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,1,2-Trichloroethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Trichloroethene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Trichlorofluoromethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,3-Trichloropropane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,4-Trimethylbenzene	0.055		mg/Kg	EPA 8260	08/26	09/13	KWM
1,3,5-Trimethylbenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Vinyl Chloride	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
p+m-Xylene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
o-Xylene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Semivolatile Organics				EPA 8270			
Phenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroethyl)ether	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Chlorophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,3-Dichlorobenzene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,4-Dichlorobenzene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzyl Alcohol	1.38		mg/Kg	EPA 8270	09/06	09/30	MTT
1,2-Dichlorobenzene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Methylphenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroisopropyl)e	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Methylphenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
n-Nitroso-di-n-Propylam	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachloroethane	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Nitrobenzene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Isophorone	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Nitrophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dimethylphenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzoic Acid	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroethoxy)Meth	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dichlorophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,2,4-Trichlorobenzene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Naphthalene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chloroaniline	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorobutadiene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chloro-3-Methylphenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Methylnaphthalene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorocyclopentadie	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4,6-Trichlorophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4,5-Trichlorophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Chloronaphthalene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT

2-2-94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Qualifier/Comments

Chemlab Ref.# :93.4354-6
Client Sample ID :LAY-LF01-SD04 POINT LAY
Matrix :SOIL

		Qualifier		Comments				
2-Nitroaniline	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Dimethylphthalate	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Acenaphthylene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
2,6-Dinitrotoluene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
3-Nitroaniline	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Acenaphthene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
2,4-Dinitrophenol	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
4-Nitrophenol	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Dibenzofuran	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
2,4-Dinitrotoluene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Diethylphthalate	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
4-Chlorophenyl-Phenylet	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Fluorene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
4-Nitroaniline	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
4,6-Dinitro-2-Methylphe	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
n-Nitrosodiphenylamine	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
4-Bromophenyl-Phenyleth	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Hexachlorobenzene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Pentachlorophenol	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Phenanthrene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Anthracene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
di-n-Butylphthalate	1.22 ~~1.50~~	~~B~~	mg/Kg		EPA 8270	(U)-E.1	09/06 09/30	MTT
Fluoranthene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Pyrene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Butylbenzylphthalate	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
3,3-Dichlorobenzidine	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Benzo(a)Anthracene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Chrysene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
bis(2-Ethylhexyl)Phthal	0.595 ~~1.00~~	~~B~~	mg/Kg		EPA 8270	(U)-E.2	09/06 09/30	MTT
di-n-Octylphthalate	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Benzo(b)Fluoranthene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Benzo(k)Fluoranthene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Benzo(a)Pyrene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Indeno(1,2,3-cd)Pyrene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Dibenz(a,h)Anthracene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Benzo(g,h,i)Perylene	0.400	U	mg/Kg		EPA 8270		09/06 09/30	MTT
Sample Preparation	---				EPA 3050 Digest			
Total Metals Analysis	---				-			
ICP Screen, ICF					EPA	n/a		
Aluminum	2400		mg/Kg		EPA 6010		08/31 09/02	DFL
Antimony	82	U J	mg/Kg	J.3	EPA 6010		08/31 09/02	DFL
Arsenic	82	U	mg/Kg		EPA 6010		08/31 09/02	DFL
Barium	260		mg/Kg		EPA 6010		08/31 09/02	DFL
Beryllium	41	U	mg/Kg		EPA 6010		08/31 09/02	DFL
Cadmium	41	U	mg/Kg		EPA 6010		08/31 09/02	DFL
Calcium	6300		mg/Kg		EPA 6010		08/31 09/02	DFL
Chromium	13		mg/Kg		EPA 6010		08/31 09/02	DFL
Cobalt	8.2	U	mg/Kg		EPA 6010		08/31 09/02	DFL
Copper	55		mg/Kg		EPA 6010		08/31 09/02	DFL

Original Changes
S.L. 2/2/94

Compiled: SMF
11/29/94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B S
ANCHORAGE, AK 8
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-6
Client Sample ID :LAY-LF01-SD04 POINT LAY
Matrix :SOIL

			Qualifier		Comment				
Iron	70000			mg/Kg		EPA 6010	08/31	09/02	DFI
Lead	18			mg/Kg		EPA 6010	08/31	09/02	DFI
Magnesium	1900			mg/Kg		EPA 6010	08/31	09/02	DFI
Manganese	220		J	mg/Kg	J.3	EPA 6010	08/31	09/02	DFI
Molybdenum	41	U		mg/Kg		EPA 6010	08/31	09/02	DFI
Nickel	13			mg/Kg		EPA 6010	08/31	09/02	DFI
Potassium	410	U		mg/Kg		EPA 6010	08/31	09/06	DLC
Selenium	82	U	J	mg/Kg	J.3, L	EPA 6010	08/31	09/02	DFI
Silver	41	U	R	mg/Kg	J.1	EPA 6010	08/31	09/02	DFI
Sodium	120			mg/Kg		EPA 6010	08/31	09/06	DLC
Thallium	0.42	U		mg/Kg		EPA 7841	08/30	09/01	KAH
Vanadium	11			mg/Kg		EPA 6010	08/31	09/02	DFI
Zinc	380			mg/Kg		EPA 6010	08/31	09/02	DFI
TOC, Soil	15800			mg/Kg		PSEP Ref Lab			

All chgs S.L. 2/3/94

---

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyz
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-8
Client Sample ID :LAY-LF01-SD04 POINT LAY DUPLICATE
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70106
Report Completed :10/07/93
Collected :08/24/93 @ 15:15 hrs
Received :08/26/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Sample Preparation	---			EPA 3050 Digest				
Total Metals Analysis	---			-				
ICP Screen, ICP				EPA	n/a			
Aluminum	1700		mg/Kg	EPA 6010		08/31	09/02	DFL
Antimony	82	U	mg/Kg	EPA 6010		08/31	09/02	DFL
Arsenic	82	U	mg/Kg	EPA 6010		08/31	09/02	DFL
Barium	200		mg/Kg	EPA 6010		08/31	09/02	DFL
Beryllium	41	U	mg/Kg	EPA 6010		08/31	09/02	DFL
Cadmium	41	U	mg/Kg	EPA 6010		08/31	09/02	DFL
Calcium	3900		mg/Kg	EPA 6010		08/31	09/02	DFL
Chromium	10		mg/Kg	EPA 6010		08/31	09/02	DFL
Cobalt	8.2	U	mg/Kg	EPA 6010		08/31	09/02	DFL
Copper	43		mg/Kg	EPA 6010		08/31	09/02	DFL
Iron	58000		mg/Kg	EPA 6010		08/31	09/02	DFL
Lead	24		mg/Kg	EPA 6010		08/31	09/02	DFL
Magnesium	1000		mg/Kg	EPA 6010		08/31	09/02	DFL
Manganese	170		mg/Kg	EPA 6010		08/31	09/02	DFL
Molybdenum	41	U	mg/Kg	EPA 6010		08/31	09/02	DFL
Nickel	8.6		mg/Kg	EPA 6010		08/31	09/02	DFL
Potassium	410	U	mg/Kg	EPA 6010		08/31	09/06	DLG
Selenium	82	U	mg/Kg	EPA 6010		08/31	09/02	DFL
Silver	41	U	mg/Kg	EPA 6010		08/31	09/02	DFL
Sodium	110		mg/Kg	EPA 6010		08/31	09/06	DLG
Thallium	0.42	U	mg/Kg	EPA 7841		08/30	09/01	KAW
Vanadium	5.4		mg/Kg	EPA 6010		08/31	09/02	DFL
Zinc	320		mg/Kg	EPA 6010		08/31	09/02	DFL

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-7
Client Sample ID :LAY-LF01-SD04 SPIKE
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70106
Report Completed :10/07/93
Collected :08/24/93 @ 15:15 hrs
Received :08/26/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. FOR SPIKE AND SPIKE DUPLICATE RECOVERY AND RPD, SEE QC SUMMARY.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.528		mg/Kg	EPA 8260		08/26	09/13	KWM
Bromobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromochloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromodichloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromoform	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromomethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
n-Butylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
sec-Butylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
tert-Butylbenzne	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Carbon Tetrachloride	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chlorobenzene	0.541		mg/Kg	EPA 8260		08/26	09/13	KWM
Chloroethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloroform	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
2-Chlorotoluene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
4-Chlorotoluene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromochloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
12Dibromo3Chloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dibromoethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromomethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,4-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dichlorodifluoromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloroethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethene	0.084		mg/Kg	EPA 8260		08/26	09/13	KWM
cis-1,2-Dichloroethene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
trans1,2-Dichloroethene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
2,2-Dichloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloropropene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Ethylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Hexachlorobutadiene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Isopropylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-7
Client Sample ID :LAY-LF01-SD04 SPIKE
Matrix :SOIL

p-Isopropyltoluene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Methylene Chloride	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Napthalene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
n-Propylbenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Styrene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1112-Tetrachloroethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1122-Tetrachloroethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Tetrachloroethene	0.305		mg/Kg	EPA 8260	08/26	09/13	KWM
Toluene	0.594		mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,3-Trichlorobenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,4-Trichlorobenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,1,1-Trichloroethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,1,2-Trichloroethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Trichloroethene	0.375		mg/Kg	EPA 8260	08/26	09/13	KWM
Trichlorofluoromethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,3-Trichloropropane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,4-Trimethylbenzene	0.060		mg/Kg	EPA 8260	08/26	09/13	KWM
1,3,5-Trimethylbenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Vinyl Chloride	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
p+m-Xylene	0.054		mg/Kg	EPA 8260	08/26	09/13	KWM
o-Xylene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Semivolatile Organics				EPA 8270			
Phenol	2.58		mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroethyl)ether	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Chlorophenol	2.44		mg/Kg	EPA 8270	09/06	09/30	MTT
1,3-Dichlorobenzene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,4-Dichlorobenzene	2.12		mg/Kg	EPA 8270	09/06	09/30	MTT
Benzyl Alcohol	1.45		mg/Kg	EPA 8270	09/06	09/30	MTT
1,2-Dichlorobenzene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Methylphenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroisopropyl)e	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Methylphenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
n-Nitroso-di-n-Propylam	2.82		mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachloroethane	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Nitrobenzene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Isophorone	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Nitrophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dimethylphenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzoic Acid	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroethoxy)Meth	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dichlorophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,2,4-Trichlorobenzene	2.66		mg/Kg	EPA 8270	09/06	09/30	MTT
Naphthalene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chloroaniline	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorobutadiene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chloro-3-Methylphenol	3.15		mg/Kg	EPA 8270	09/06	09/30	MTT
2-Methylnaphthalene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorocyclopentadie	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4,6-Trichlorophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4,5-Trichlorophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-7
Client Sample ID :LAY-LF01-SD04 SPIKE
Matrix :SOIL

2-Chloronaphthalene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
2-Nitroaniline	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
Dimethylphthalate	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
Acenaphthylene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
2,6-Dinitrotoluene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
3-Nitroaniline	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
Acenaphthene	3.19		mg/Kg	EPA 8270		09/06	09/30	MT
2,4-Dinitrophenol	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
4-Nitrophenol	3.03		mg/Kg	EPA 8270		09/06	09/30	MT
Dibenzofuran	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
2,4-Dinitrotoluene	2.77		mg/Kg	EPA 8270		09/06	09/30	MT
Diethylphthalate	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
4-Chlorophenyl-Phenylet	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
Fluorene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
4-Nitroaniline	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
4,6-Dinitro-2-Methylphe	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
n-Nitrosodiphenylamine	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MT
4-Bromophenyl-Phenyleth	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Hexachlorobenzene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Pentachlorophenol	2.22		mg/Kg	EPA 8270		09/06	09/30	MTT
Phenanthrene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Anthracene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
di-n-Butylphthalate	3.40		mg/Kg	EPA 8270		09/06	09/30	MTT
Fluoranthene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Pyrene	2.98		mg/Kg	EPA 8270		09/06	09/30	MTT
Butylbenzylphthalate	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
3,3-Dichlorobenzidine	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Benzo(a)Anthracene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Chrysene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
bis(2-Ethylhexyl)Phthal	1.00	U	mg/Kg	EPA 8270		09/06	09/30	MTT
di-n-Octylphthalate	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Benzo(b)Fluoranthene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Benzo(k)Fluoranthene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Benzo(a)Pyrene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Indeno(1,2,3-cd)Pyrene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Dibenz(a,h)Anthracene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Benzo(g,h,i)Perylene	0.400	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Sample Preparation	---			EPA 3050 Digest				
Total Metals Analysis	---			-				
ICP Screen, ICP				EPA	n/a			
Aluminum	2300		mg/Kg	EPA 6010		08/31	09/02	DFL
Antimony	130		mg/Kg	EPA 6010		08/31	09/02	DFL
Arsenic	190		mg/Kg	EPA 6010		08/31	09/02	DFL
Barium	430		mg/Kg	EPA 6010		08/31	09/02	DFL
Beryllium	75		mg/Kg	EPA 6010		08/31	09/02	DFL
Cadmium	92		mg/Kg	EPA 6010		08/31	09/02	DFL
Calcium	6400		mg/Kg	EPA 6010		08/31	09/02	DFL
Chromium	160		mg/Kg	EPA 6010		08/31	09/02	DFL
Cobalt	150		mg/Kg	EPA 6010		08/31	09/02	DFL

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-7
Client Sample ID :LAY-LF01-SD04 SPIKE
Matrix :SOIL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Copper	210		mg/Kg	EPA 6010	08/31	09/02	DFL
Iron	71000		mg/Kg	EPA 6010	08/31	09/02	DFL
Lead	150		mg/Kg	EPA 6010	08/31	09/02	DFL
Magnesium	2800		mg/Kg	EPA 6010	08/31	09/02	DFL
Manganese	360		mg/Kg	EPA 6010	08/31	09/02	DFL
Molybdenum	170		mg/Kg	EPA 6010	08/31	09/02	DFL
Nickel	160		mg/Kg	EPA 6010	08/31	09/02	DFL
Potassium	1800		mg/Kg	EPA 6010	08/31	09/02	DFL
Selenium	240		mg/Kg	EPA 6010	08/31	09/06	DLG
Silver	41	U	mg/Kg	EPA 6010	08/31	09/02	DFL
Sodium	1600		mg/Kg	EPA 6010	08/31	09/02	DFL
Thallium	3.4		mg/Kg	EPA 6010	08/31	09/06	DLG
Vanadium	150		mg/Kg	EPA 7841	08/30	09/01	KAW
Zinc	530		mg/Kg	EPA 6010	08/31	09/02	DFL

==

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-12
Client Sample ID :LAY-LF01-SD04 POINT LAY SPIKE DUPLICATE
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70106
Report Completed :10/07/93
Collected :08/24/93 @ 15:15 hr.
Received :08/26/93 @ 12:00 hr.
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.534		mg/Kg	EPA 8260		08/26	09/13	KWM
Bromobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromochloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromodichloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromoform	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromomethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
n-Butylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
sec-Butylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
tert-Butylbenzne	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Carbon Tetrachloride	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chlorobenzene	0.562		mg/Kg	EPA 8260		08/26	09/13	KWM
Chloroethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloroform	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
2-Chlorotoluene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
4-Chlorotoluene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromochloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
12Dibromo3Chloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dibromoethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromomethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,4-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dichlorodifluoromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloroethane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethene	0.086		mg/Kg	EPA 8260		08/26	09/13	KWM
cis-1,2-Dichloroethene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
trans1,2-Dichloroethene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
2,2-Dichloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloropropene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Ethylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Hexachlorobutadiene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Isopropylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM
p-Isopropyltoluene	0.050	U	mg/Kg	EPA 8260		08/26	09/13	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-12
Client Sample ID :LAY-LF01-SD04 POINT LAY SPIKE DUPLICATE
Matrix :SOIL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Methylene Chloride	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Napthalene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
n-Propylbenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Styrene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1112-Tetrachloroethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1122-Tetrachloroethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Tetrachloroethene	0.291		mg/Kg	EPA 8260	08/26	09/13	KWM
Toluene	0.609		mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,3-Trichlorobenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,4-Trichlorobenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,1,1-Trichloroethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,1,2-Trichloroethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Trichloroethene	0.384		mg/Kg	EPA 8260	08/26	09/13	KWM
Trichlorofluoromethane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,3-Trichloropropane	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,4-Trimethylbenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,3,5-Trimethylbenzene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Vinyl Chloride	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
p+m-Xylene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
o-Xylene	0.050	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Semivolatile Organics				EPA 8270			
Phenol	2.04		mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroethyl)ether	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Chlorophenol	1.93		mg/Kg	EPA 8270	09/06	09/30	MTT
1,3-Dichlorobenzene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,4-Dichlorobenzene	1.67		mg/Kg	EPA 8270	09/06	09/30	MTT
Benzyl Alcohol	1.08		mg/Kg	EPA 8270	09/06	09/30	MTT
1,2-Dichlorobenzene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Methylphenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroisopropyl)e	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Methylphenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
n-Nitroso-di-n-Propylam	2.26		mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachloroethane	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Nitrobenzene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Isophorone	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Nitrophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dimethylphenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzoic Acid	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroethoxy)Meth	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dichlorophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,2,4-Trichlorobenzene	2.11		mg/Kg	EPA 8270	09/06	09/30	MTT
Naphthalene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chloroaniline	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorobutadiene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chloro-3-Methylphenol	2.67		mg/Kg	EPA 8270	09/06	09/30	MTT
2-Methylnaphthalene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorocyclopentadie	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4,6-Trichlorophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4,5-Trichlorophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Chloronaphthalene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

5633 B ST
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-12
Client Sample ID :LAY-LF01-SD04 POINT LAY SPIKE DUPLICATE
Matrix :SOIL

2-Nitroaniline	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Dimethylphthalate	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Acenaphthylene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,6-Dinitrotoluene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
3-Nitroaniline	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Acenaphthene	2.68		mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dinitrophenol	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Nitrophenol	2.91		mg/Kg	EPA 8270	09/06	09/30	MTT
Dibenzofuran	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dinitrotoluene	2.42		mg/Kg	EPA 8270	09/06	09/30	MTT
Diethylphthalate	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chlorophenyl-Phenylet	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Fluorene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Nitroaniline	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4,6-Dinitro-2-Methylphe	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
n-Nitrosodiphenylamine	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Bromophenyl-Phenyleth	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorobenzene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Pentachlorophenol	2.60		mg/Kg	EPA 8270	09/06	09/30	MTT
Phenanthrene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Anthracene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
di-n-Butylphthalate	3.29		mg/Kg	EPA 8270	09/06	09/30	MTT
Fluoranthene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Pyrene	2.61		mg/Kg	EPA 8270	09/06	09/30	MTT
Butylbenzylphthalate	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
3,3-Dichlorobenzidine	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(a)Anthracene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Chrysene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Ethylhexyl)Phthal	1.00	U	mg/Kg	EPA 8270	09/06	09/30	MTT
di-n-Octylphthalate	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(b)Fluoranthene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(k)Fluoranthene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(a)Pyrene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Indeno(1,2,3-cd)Pyrene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Dibenz(a,h)Anthracene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(g,h,i)Perylene	0.400	U	mg/Kg	EPA 8270	09/06	09/30	MTT

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

~~REPORT of ANALYSIS~~

lab Ref.# :93.4356-13
Client Sample ID :LAY-LF01-SD08 POINT LAY
Matrix :SOIL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70116
Report Completed :10/06/93
Collected :08/24/93 @ 15:20 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON. 8270 ANALYSIS NOT RUN DUE TO HOLDING TIME BEING EXCEEDED.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Bromobenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Bromochloromethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Bromodichloromethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Bromoform	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Bromomethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
n-Butylbenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
sec-Butylbenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
rt-Butylbenzne	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
rbon Tetrachloride	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Chlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Chloroethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Chloroform	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Chloromethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
2-Chlorotoluene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
4-Chlorotoluene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Dibromochloromethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
12Dibromo3Chloropropane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,2-Dibromoethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Dibromomethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,2-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,3-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,4-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Dichlorodifluoromethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,1-Dichloroethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,2-Dichloroethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,1-Dichloroethene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
cis-1,2-Dichloroethene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
trans1,2-Dichloroethene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,2-Dichloropropane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,3-Dichloropropane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
2,2-Dichloropropane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,1-Dichloropropene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Ethylbenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Hexachlorobutadiene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Isopropylbenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4356-13
Client Sample ID :LAY-LF01-SD08 POINT LAY
Matrix :SOIL

p-Isopropyltoluene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Methylene Chloride	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Napthalene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
n-Propylbenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Styrene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1112-Tetrachloroethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1122-Tetrachloroethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Tetrachloroethene	0.622		mg/Kg	EPA 8260		08/26	09/04	SGM
Toluene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,2,3-Trichlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,2,4-Trichlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,1,1-Trichloroethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,1,2-Trichloroethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Trichloroethene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Trichlorofluoromethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,2,3-Trichloropropane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
1,2,4-Trimethylbenzene	0.057		mg/Kg	EPA 8260		08/26	09/04	SGM
1,3,5-Trimethylbenzene	0.050		mg/Kg	EPA 8260		08/26	09/04	SGM
Vinyl Chloride	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
p+m-Xylene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
o-Xylene	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Sample Preparation	---			EPA 3050 Digest				
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	2200		mg/Kg	EPA 6010		09/16	09/20	DLG
Antimony	56	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Arsenic	56	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Barium	190		mg/Kg	EPA 6010		09/16	09/20	DLG
Beryllium	28	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Cadmium	28	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Calcium	2600		mg/Kg	EPA 6010		09/16	09/20	DLG
Chromium	5.1		mg/Kg	EPA 6010		09/16	09/20	DLG
Cobalt	5.6	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Copper	16		mg/Kg	EPA 6010		09/16	09/20	DLG
Iron	19000		mg/Kg	EPA 6010		09/16	09/20	DLG
Lead	5.6	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Magnesium	1500		mg/Kg	EPA 6010		09/16	09/20	DLG
Manganese	180		mg/Kg	EPA 6010		09/16	09/20	DLG
Molybdenum	2.8	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Nickel	13		mg/Kg	EPA 6010		09/16	09/20	DLG
Potassium	280		mg/Kg	EPA 6010		09/16	09/21	DFL
Selenium	56	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Silver	2.8	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Sodium	75		mg/Kg	EPA 6010		09/16	09/21	DFL
Thallium	0.29	U	mg/Kg	EPA 7841		09/16	09/17	BMW
Vanadium	11		mg/Kg	EPA 6010		09/16	09/20	DLG
Zinc	125		mg/Kg	EPA 6010		09/16	09/20	DLG
TOC, Soil	28400		mg/Kg	PSEP Ref Lab				

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

mlab Ref.# :93.4356-15
Client Sample ID :LAY-LF01-SD08 POINT LAY DUPLICATE
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70116
Report Completed :10/06/93
Collected :08/24/93 @ 15:20 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By : Steph C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Sample Preparation	---			EPA 3050 Digest				
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	2600		mg/Kg	EPA 6010		09/16	09/20	DLG
Antimony	56	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Arsenic	56	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Barium	280		mg/Kg	EPA 6010		09/16	09/20	DLG
Beryllium	28	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Cadmium	2.8	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Calcium	3100		mg/Kg	EPA 6010		09/16	09/20	DLG
Chromium	6.2		mg/Kg	EPA 6010		09/16	09/20	DLG
Cobalt	5.6	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Copper	17		mg/Kg	EPA 6010		09/16	09/20	DLG
Iron	19000		mg/Kg	EPA 6010		09/16	09/20	DLG
Lead	5.7		mg/Kg	EPA 6010		09/16	09/20	DLG
Magnesium	1600		mg/Kg	EPA 6010		09/16	09/20	DLG
Manganese	190		mg/Kg	EPA 6010		09/16	09/20	DLG
Molybdenum	2.8	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Nickel	14		mg/Kg	EPA 6010		09/16	09/20	DLG
Potassium	340		mg/Kg	EPA 6010		09/16	09/21	DFL
Selenium	56	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Silver	2.8	U	mg/Kg	EPA 6010		09/16	09/20	DLG
Sodium	82		mg/Kg	EPA 6010		09/16	09/21	DFL
Thallium	0.29	U	mg/Kg	EPA 7841		09/16	09/17	BMW
Vanadium	12		mg/Kg	EPA 6010		09/16	09/20	DLG
Zinc	140		mg/Kg	EPA 6010		09/16	09/20	DLG

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4356-14
Client Sample ID :LAY-LF01-SD08 POINT LAY SPIKE
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70116
Report Completed :10/06/93
Collected :08/24/93 @ 15:20 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By : C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Sample Preparation	---			EPA 3050 Digest				
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	3250		mg/Kg	EPA 6010		09/16	09/20	DLG
Antimony	1000		mg/Kg	EPA 6010		09/16	09/20	DLG
Arsenic	100		mg/Kg	EPA 6010		09/16	09/20	DLG
Barium	350		mg/Kg	EPA 6010		09/16	09/20	DLG
Beryllium	440		mg/Kg	EPA 6010		09/16	09/20	DLG
Cadmium	45		mg/Kg	EPA 6010		09/16	09/20	DLG
Calcium	4400		mg/Kg	EPA 6010		09/16	09/20	DLG
Chromium	110		mg/Kg	EPA 6010		09/16	09/20	D[illegible]
Cobalt	100		mg/Kg	EPA 6010		09/16	09/20	DL[illegible]
Copper	120		mg/Kg	EPA 6010		09/16	09/20	DLG
Iron	30000		mg/Kg	EPA 6010		09/16	09/20	DLG
Lead	100		mg/Kg	EPA 6010		09/16	09/20	DLG
Magnesium	2750		mg/Kg	EPA 6010		09/16	09/20	DLG
Manganese	300		mg/Kg	EPA 6010		09/16	09/20	DLG
Molybdenum	97		mg/Kg	EPA 6010		09/16	09/20	DLG
Nickel	110		mg/Kg	EPA 6010		09/16	09/20	DLG
Potassium	1320		mg/Kg	EPA 6010		09/16	09/21	DFL
Selenium	1100		mg/Kg	EPA 6010		09/16	09/20	DLG
Silver	13		mg/Kg	EPA 6010		09/16	09/20	DLG
Sodium	1080		mg/Kg	EPA 6010		09/16	09/21	DFL
Thallium	2.45		mg/Kg	EPA 7841		09/16	09/17	BMW
Vanadium	110		mg/Kg	EPA 6010		09/16	09/20	DLG
Zinc	250		mg/Kg	EPA 6010		09/16	09/20	DLG

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-11
Client Sample ID :LAY-LF01-2SD12
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 17:30 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	88.6		%	SM17 2540G			09/10	EAL
Hydrocarbons VPH	1.73		mg/Kg	EPA 5030/8015M		09/10	09/15	WLS
Hydrocarbons EPH	4.00	U	mg/Kg	3510/3550/8100M		09/14	09/17	JBH
Volatile Organics								
Benzene				EPA 8260				
Bromobenzene	0.020	U	mg/Kg	EPA 8260				
Bromochloromethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
Bromodichloromethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
Bromoform	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
Bromomethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
n-Butylbenzene	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
sec-Butylbenzene	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
tert-Butylbenzne	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
Carbon Tetrachloride	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
Chlorobenzene	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
Chloroethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
Chloroform	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
Chloromethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
2-Chlorotoluene	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
4-Chlorotoluene	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
Dibromochloromethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
12Dibromo3Chloropropane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
1,2-Dibromoethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
Dibromomethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
1,2-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
1,3-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
1,4-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
Dichlorodifluoromethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
1,1-Dichloroethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
1,2-Dichloroethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
1,1-Dichloroethene	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
cis-1,2-Dichloroethene	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
trans1,2-Dichloroethene	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
1,2-Dichloropropane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
1,3-Dichloropropane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
2,2-Dichloropropane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
1,1-Dichloropropene	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
						09/16	09/28	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-11
Client Sample ID :LAY-LF01-2SD12
Matrix :SOIL

Ethylbenzene	0.054		mg/Kg	EPA 8260	09/16	09/28	KWM
Hexachlorobutadiene	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
Isopropylbenzene	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
p-Isopropyltoluene	0.067		mg/Kg	EPA 8260	09/16	09/28	KWM
Methylene Chloride	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
Napthalene	0.129		mg/Kg	EPA 8260	09/16	09/28	KWM
n-Propylbenzene	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
Styrene	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
1112-Tetrachloroethane	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
1122-Tetrachloroethane	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
Tetrachloroethene	0.727		mg/Kg	EPA 8260	09/16	09/28	KWM
Toluene	0.042		mg/Kg	EPA 8260	09/16	09/28	KWM
1,2,3-Trichlorobenzene	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
1,2,4-Trichlorobenzene	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
1,1,1-Trichloroethane	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
1,1,2-Trichloroethane	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
Trichloroethene	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
Trichlorofluoromethane	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
1,2,3-Trichloropropane	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
1,2,4-Trimethylbenzene	0.213		mg/Kg	EPA 8260	09/16	09/28	KWM
1,3,5-Trimethylbenzene	0.128		mg/Kg	EPA 8260	09/16	09/28	KWM
Vinyl Chloride	0.020	U	mg/Kg	EPA 8260	09/16	09/28	KWM
p+m-Xylene	0.217		mg/Kg	EPA 8260	09/16	09/28	KWM
o-Xylene	0.095		mg/Kg	EPA 8260	09/16	09/28	KWM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT OF ANALYSIS

Chemlab Ref.# :93.4692-12
Client Sample ID :LAY-LF01-2SD13
Matrix :SOIL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 17:45 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT WITH UNWEATHERED MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	37.6		%	SM17 2540G			09/10	EAL
Hydrocarbons VPH	2.75	U	mg/Kg	EPA 5030/8015M		09/10	09/15	WLS
Hydrocarbons EPH	624		mg/Kg	3510/3550/8100M		09/14	09/19	JBH
Volatile Organics				EPA 8260				
Benzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromochloromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromodichloromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromoform	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromomethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
n-Butylbenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
sec-Butylbenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
tert-Butylbenzne	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Carbon Tetrachloride	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chlorobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroform	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
2-Chlorotoluene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
4-Chlorotoluene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromochloromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
12Dibromo3Chloropropane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dibromoethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromomethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichlorobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichlorobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,4-Dichlorobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dichlorodifluoromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloroethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
cis-1,2-Dichloroethene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
trans1,2-Dichloroethene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloropropane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichloropropane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
2,2-Dichloropropane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-12
Client Sample ID :LAY-LF01-2SD13
Matrix :SOIL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

1,1-Dichloropropene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Ethylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Hexachlorobutadiene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Isopropylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
p-Isopropyltoluene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Methylene Chloride	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Napthalene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
n-Propylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Styrene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1112-Tetrachloroethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1122-Tetrachloroethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Tetrachloroethene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Toluene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,3-Trichlorobenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trichlorobenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1,1-Trichloroethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1,2-Trichloroethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Trichloroethene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Trichlorofluoromethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,3-Trichloropropane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trimethylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,3,5-Trimethylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Vinyl Chloride	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
p+m-Xylene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
o-Xylene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM

===

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-13
Client Sample ID :LAY-LF01-2SD13 SPIKE
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 17:45 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. FOR SPIKE CONCENTRATION AND PERCENT RECOVERY, SEE QA/QC PACKAGE. EPH ANALYSIS HAS MATRIX INTERFERENCE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	37.6		%	SM17 2540G			09/10	EAL
Hydrocarbons VPH	75.8		mg/Kg	EPA 5030/8015M		09/10	09/15	WLS
Hydrocarbons EPH	610		mg/Kg	3510/3550/8100M		09/14	09/20	JBH
Volatile Organics				EPA 8260				
Benzene	1.40		mg/Kg	EPA 8260		09/10	09/28	KWM
Bromobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromochloromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromodichloromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromoform	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromomethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
n-Butylbenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
sec-Butylbenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
tert-Butylbenzne	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Carbon Tetrachloride	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chlorobenzene	1.38		mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroform	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
2-Chlorotoluene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
4-Chlorotoluene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromochloromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
12Dibromo3Chloropropane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dibromoethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromomethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichlorobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichlorobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,4-Dichlorobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dichlorodifluoromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloroethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethene	0.269		mg/Kg	EPA 8260		09/10	09/28	KWM
cis-1,2-Dichloroethene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
trans1,2-Dichloroethene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloropropane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichloropropane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-13
Client Sample ID :LAY-LF01-2SD13 SPIKE
Matrix :SOIL

2,2-Dichloropropane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1-Dichloropropene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Ethylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Hexachlorobutadiene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Isopropylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
p-Isopropyltoluene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Methylene Chloride	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Napthalene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
n-Propylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Styrene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1112-Tetrachloroethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1122-Tetrachloroethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Tetrachloroethene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Toluene	1.51		mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,3-Trichlorobenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trichlorobenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1,1-Trichloroethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1,2-Trichloroethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Trichloroethene	1.43		mg/Kg	EPA 8260	09/10	09/28	KWM
Trichlorofluoromethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,3-Trichloropropane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trimethylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,3,5-Trimethylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Vinyl Chloride	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
p+m-Xylene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
o-Xylene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM

===

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-14
Client Sample ID :LAY-LF01-2SD13 SPIKE DUPLICATE
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 17:45 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. FOR SPIKE CONCENTRATION AND PERCENT RECOVERY, SEE QA/QC PACKAGE. EPH ANALYSIS HAS MATRIX INTERFERENCE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	37.6		%	SM17 2540G			09/10	EAL
Hydrocarbons VPH	71.7		mg/Kg	EPA 5030/8015M		09/10	09/15	WLS
Hydrocarbons EPH	500		mg/Kg	3510/3550/8100M		09/14	09/20	JBH
Volatile Organics				EPA 8260				
Benzene	1.33		mg/Kg	EPA 8260		09/10	09/28	KWM
Bromobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromochloromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromodichloromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromoform	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromomethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
n-Butylbenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
sec-Butylbenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
tert-Butylbenzne	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Carbon Tetrachloride	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chlorobenzene	1.35		mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroform	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
2-Chlorotoluene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
4-Chlorotoluene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromochloromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
12Dibromo3Chloropropane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dibromoethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromomethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichlorobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichlorobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,4-Dichlorobenzene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dichlorodifluoromethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloroethane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethene	0.230		mg/Kg	EPA 8260		09/10	09/28	KWM
cis-1,2-Dichloroethene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
trans1,2-Dichloroethene	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloropropane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichloropropane	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-14
Client Sample ID :LAY-LF01-2SD13 SPIKE DUPLICATE
Matrix :SOIL

2,2-Dichloropropane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1-Dichloropropene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Ethylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Hexachlorobutadiene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Isopropylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
p-Isopropyltoluene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Methylene Chloride	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Napthalene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
n-Propylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Styrene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1112-Tetrachloroethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1122-Tetrachloroethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Tetrachloroethene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Toluene	1.42		mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,3-Trichlorobenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trichlorobenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1,1-Trichloroethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1,2-Trichloroethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Trichloroethene	1.30		mg/Kg	EPA 8260	09/10	09/28	KWM
Trichlorofluoromethane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,3-Trichloropropane	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trimethylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trimethylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,3,5-Trimethylbenzene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	[illegible]
Vinyl Chloride	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
p+m-Xylene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM
o-Xylene	0.130	U	mg/Kg	EPA 8260	09/10	09/28	KWM

==

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT OF ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-15
Client Sample ID :LAY-LF01-2SD14
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 18:00 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	22.0		%	SM17 2540G			09/10	EAL
Hydrocarbons VPH	11.9		mg/Kg	EPA 5030/8015M		09/10	09/15	WLS
Hydrocarbons EPH	39.9		mg/Kg	3510/3550/8100M		09/14	09/17	JBH
Volatile Organics								
Benzene				EPA 8260				
Bromobenzene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromochloromethane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromodichloromethane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromoform	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromomethane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
n-Butylbenzene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
sec-Butylbenzene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
tert-Butylbenzne	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Carbon Tetrachloride	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chlorobenzene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroethane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroform	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloromethane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
2-Chlorotoluene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
4-Chlorotoluene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromochloromethane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
12Dibromo3Chloropropane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dibromoethane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromomethane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichlorobenzene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichlorobenzene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,4-Dichlorobenzene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dichlorodifluoromethane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloroethane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
cis-1,2-Dichloroethene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
trans1,2-Dichloroethene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloropropane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichloropropane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
2,2-Dichloropropane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-15
Client Sample ID :LAY-LF01-2SD14
Matrix :SOIL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

1,1-Dichloropropene	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Ethylbenzene	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Hexachlorobutadiene	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Isopropylbenzene	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
p-Isopropyltoluene	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Methylene Chloride	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Napthalene	0.409		mg/Kg	EPA 8260	09/10	09/28	KWM
n-Propylbenzene	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Styrene	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1112-Tetrachloroethane	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1122-Tetrachloroethane	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Tetrachloroethene	1.92		mg/Kg	EPA 8260	09/10	09/28	KWM
Toluene	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,3-Trichlorobenzene	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trichlorobenzene	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1,1-Trichloroethane	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1,2-Trichloroethane	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Trichloroethene	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Trichlorofluoromethane	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,3-Trichloropropane	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trimethylbenzene	0.552		mg/Kg	EPA 8260	09/10	09/28	KWM
1,3,5-Trimethylbenzene	0.342		mg/Kg	EPA 8260	09/10	09/28	KWM
Vinyl Chloride	0.240	U	mg/Kg	EPA 8260	09/10	09/28	KWM
p+m-Xylene	0.459		mg/Kg	EPA 8260	09/10	09/28	KWM
o-Xylene	0.265		mg/Kg	EPA 8260	09/10	09/28	KWM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-10
Client Sample ID :LAY-LF01-SW04 POINT LAY
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70116
Report Completed :10/06/93
Collected :08/24/93 @ 15:10 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By : Steph C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.018		mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dichlorodifluoromethane	0.033		mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
cis-1,2-Dichloroethene	0.0065		mg/L	EPA 8260		09/02	09/02	MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Ethylbenzene	0.0040		mg/L	EPA 8260		09/02	09/02	MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
p-Isopropyltoluene	0.0017		mg/L	EPA 8260		09/02	09/02	MCM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

5633 B STREET
ANCHORAGE, A 18
TEL: (907) 5 3
FAX: (907) 56 01

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-10
Client Sample ID :LAY-LF01-SW04 POINT LAY
Matrix :WATER

Qualifier/Comments

Methylene Chloride	0.0046		mg/L	EPA 8260	(u) - G.1	09/02	09/02	MC
Napthalene	0.0010	U	mg/L	EPA 8260	(J) - J.1	09/02	09/02	MC
n-Propylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
Styrene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
Tetrachloroethene	0.084		mg/L	EPA 8260		09/02	09/02	MC
Toluene	0.0073		mg/L	EPA 8260		09/02	09/02	MC
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
Trichloroethene	0.0033		mg/L	EPA 8260		09/02	09/02	MC
Trichlorofluoromethane	0.0030		mg/L	EPA 8260		09/02	09/02	MC
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
Vinyl Chloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
p+m-Xylene	0.013		mg/L	EPA 8260		09/02	09/02	MC
o-Xylene	0.0087		mg/L	EPA 8260		09/02	09/02	MC

2-3-94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Th

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-1
Client Sample ID :LAY-LF01-SW04 POINT LAY
Matrix :WATER

5633 B STR
ANCHORAGE, AK 99
TEL: (907) 562-2
FAX: (907) 561-5

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70131
Report Completed :09/20/93
Collected :08/24/93 @ 15:10
Received :08/26/93 @ 12:00
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: J.P.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	I
Semivolatile Organics				EPA 8270				
Phenol	0.017	U	mg/L	EPA 8270		09/01	09/04	[illegible]
bis(2-Chloroethyl)ether	0.017	U	mg/L	EPA 8270		09/01	09/04	[illegible]
2-Chlorophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	M
1,3-Dichlorobenzene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
1,4-Dichlorobenzene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Benzyl Alcohol	0.017	U	mg/L	EPA 8270		09/01	09/04	M
1,2-Dichlorobenzene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
2-Methylphenol	0.017	U	mg/L	EPA 8270		09/01	09/04	M
bis(2-Chloroisopropyl)e	0.017	U	mg/L	EPA 8270		09/01	09/04	M
4-Methylphenol	0.017	U	mg/L	EPA 8270		09/01	09/04	M
n-Nitroso-di-n-Propylam	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Hexachloroethane	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Nitrobenzene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Isophorone	0.017	U	mg/L	EPA 8270		09/01	09/04	M
2-Nitrophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	M
2,4-Dimethylphenol	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Benzoic Acid	0.017	U	mg/L	EPA 8270		09/01	09/04	M
bis(2-Chloroethoxy)Meth	0.017	U	mg/L	EPA 8270		09/01	09/04	M
2,4-Dichlorophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	M
1,2,4-Trichlorobenzene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Naphthalene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
4-Chloroaniline	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Hexachlorobutadiene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
4-Chloro-3-Methylphenol	0.017	U	mg/L	EPA 8270		09/01	09/04	M
2-Methylnaphthalene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Hexachlorocyclopentadie	0.017	U	mg/L	EPA 8270		09/01	09/04	M
2,4,6-Trichlorophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	M
2,4,5-Trichlorophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	M
2-Chloronaphthalene	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
2-Nitroaniline	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
Dimethylphthalate	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
Acenaphthylene	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
2,6-Dinitrotoluene	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
3-Nitroaniline	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
Acenaphthene	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
2,4-Dinitrophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
4-Nitrophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	MT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREE
ANCHORAGE, AK 9951
TEL: (907) 562-234
FAX: (907) 561-530

Chemlab Ref.# :93.4358-1
Client Sample ID :LAY-LF01-SW04 POINT LAY
Matrix :WATER

Dibenzofuran	0.017	U	mg/L	EPA 8270		09/01	09/04	M
2,4-Dinitrotoluene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Diethylphthalate	0.017	U	mg/L	EPA 8270		09/01	09/04	M
4-Chlorophenyl-Phenylet	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Fluorene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
4-Nitroaniline	0.017	U	mg/L	EPA 8270		09/01	09/04	M
4,6-Dinitro-2-Methylphe	0.017	U	mg/L	EPA 8270		09/01	09/04	M
n-Nitrosodiphenylamine	0.017	U	mg/L	EPA 8270		09/01	09/04	M
4-Bromophenyl-Phenyleth	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Hexachlorobenzene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Pentachlorophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Phenanthrene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Anthracene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
di-n-Butylphthalate	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Fluoranthene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Pyrene	0.017	U	mg/L	EPA 8270		09/01	09/04	M
Butylbenzylphthalate	0.017	U	mg/L	EPA 8270		09/01	09/04	M
3,3-Dichlorobenzidine	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
Benzo(a)Anthracene	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
Chrysene	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
bis(2-Ethylhexyl)Phthal	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
di-n-Octylphthalate	0.017	U	mg/L	EPA 8270		09/01	09/0	MT
Benzo(b)Fluoranthene	0.017	U	mg/L	EPA 8270		09/01	09/0	MT
Benzo(k)Fluoranthene	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
Benzo(a)Pyrene	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
Indeno(1,2,3-cd)Pyrene	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
Dibenz(a,h)Anthracene	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
Benzo(g,h,i)Perylene	0.017	U	mg/L	EPA 8270		09/01	09/04	MT
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.18		mg/L	EPA 6010		09/02	09/06	DL
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Barium	0.21		mg/L	EPA 6010		09/02	09/06	DL
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Calcium	81		mg/L	EPA 6010		09/02	09/06	DL
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Iron	32		mg/L	EPA 6010		09/02	09/06	DL
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Magnesium	25		mg/L	EPA 6010		09/02	09/06	DL
Manganese	0.94		mg/L	EPA 6010		09/02	09/06	DL
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Potassium	8.0		mg/L	EPA 6010		09/02	09/06	DLG
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Sodium	47		mg/L	EPA 6010		09/02	09/06	DLG
						09/15	09/17	DFL

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1909

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-1
Client Sample ID :LAY-LF01-SW04 POINT LAY
Matrix :WATER

5633 B STREE
ANCHORAGE, AK 9951
TEL: (907) 562-23
FAX: (907) 561-530

Thallium	0.005	U	mg/L	EPA 7841		09/03	09/08	E
Vanadium	0.050	U	mg/L	EPA 6010		09/02	09/06	C
Zinc	0.050	U	mg/L	EPA 6010		09/15	09/17	C
Dissolved Metals Analys	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	C
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	D
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	D
Barium	0.32		mg/L	EPA 6010		09/02	09/06	D
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	D
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	D
Calcium	81		mg/L	EPA 6010		09/02	09/06	D
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	D
Cobalt	0.10		mg/L	EPA 6010		09/02	09/06	D
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	D
Iron	22		mg/L	EPA 6010		09/02	09/06	DI
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DI
Magnesium	25		mg/L	EPA 6010		09/02	09/06	D
Manganese	0.93		mg/L	EPA 6010		09/02	09/06	DI
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Potassium	8.2		mg/L	EPA 6010		09/02	09/06	DL
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Sodium	49		mg/L	EPA 6010		09/15	09/17	DF
Thallium	0.005	U	mg/L	EPA 7841		09/03	09/08	BM
Vanadium	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Zinc	0.060		mg/L	EPA 6010		09/15	09/17	DF
TOC, Nonpurgable				EPA 9060	n/a			
...TOC Range	17.5-18.1		mg/L	EPA 9060			09/07	CM
...TOC Concentration	17.8		mg/L	EPA 9060			09/07	CM
Residue, Non-Filterable	96		mg/L	EPA 160.2		09/02	09/02	GP
Residue,Filterable(TDS)	808		mg/L	EPA 160.1	500	09/01	09/02	RJ

==

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

5633 B STR
ANCHORAGE, AK 9
TEL: (907) 562-
FAX: (907) 561-

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-3
Client Sample ID :LAY-LF01-SW04 POINT LAY DUPLICATE
Matrix :WATER

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70131
Ordered By	:RAY MORRIS	Report Completed	:09/20/93
Project Name	:DEW LINE RI/FS	Collected	:08/24/93 @ 15:10
Project#	:41096-412-01	Received	:08/26/93 @ 12:00
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	:

Sample Remarks: SAMPLE COLLECTED BY: J.P. SEE QC PACKAGE FOR SPIKE RECOVERIES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date
Total Metals Analysis	---			-			
ICP Screen, ICF				EPA	n/a		
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06
Barium	0.20		mg/L	EPA 6010		09/02	09/06
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06
Calcium	81		mg/L	EPA 6010		09/02	09/06
Chromium	0.050	U	mg/L	EPA 6010		09/02	09[illegible]
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09[illegible]
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06
Iron	32		mg/L	EPA 6010		09/02	09/06
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06
Magnesium	25		mg/L	EPA 6010		09/02	09/06
Manganese	0.95		mg/L	EPA 6010		09/02	09/06
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06
Potassium	8.3		mg/L	EPA 6010		09/02	09/06
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06
Sodium	---		mg/L	EPA 6010			
Thallium	0.005	U	mg/L	EPA 7841		09/03	09/08
Vanadium	0.050	U	mg/L	EPA 6010		09/02	09/06
Zinc	---		mg/L	EPA 6010			
Dissolved Metals Analys	---			-			
ICP Screen, ICF				EPA	n/a		
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06
Barium	0.32		mg/L	EPA 6010		09/02	09/06
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06
Calcium	81		mg/L	EPA 6010		09/02	09/06
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06
Cobalt	0.10		mg/L	EPA 6010		09/02	09/06
Copper	0.050	U	mg/L	EPA 6010		09/02	09[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STF
ANCHORAGE, AK 9
TEL: (907) 562-
FAX: (907) 561-

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-3
Client Sample ID :LAY-LF01-SW04 POINT LAY DUPLICATE
Matrix :WATER

Iron	22		mg/L	EPA 6010	09/02 09/06
Lead	0.10	U	mg/L	EPA 6010	09/02 09/06
Magnesium	25		mg/L	EPA 6010	09/02 09/06
Manganese	0.94		mg/L	EPA 6010	09/02 09/06
Molybdenum	0.050	U	mg/L	EPA 6010	09/02 09/06
Nickel	0.050	U	mg/L	EPA 6010	09/02 09/06
Potassium	8.0		mg/L	EPA 6010	09/02 09/06
Selenium	0.10	U	mg/L	EPA 6010	09/02 09/06
Silver	0.050	U	mg/L	EPA 6010	09/02 09/06
Sodium	---		mg/L	EPA 6010	
Thallium	0.005	U	mg/L	EPA 7841	09/03 09/08
Vanadium	0.050	U	mg/L	EPA 6010	09/02 09/06
Zinc	---		mg/L	EPA 6010	

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STR
ANCHORAGE, AK 9
TEL: (907) 562-
FAX: (907) 561-

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-2
Client Sample ID :LAY-LF01-SW04 POINT LAY SPIKE
Matrix :WATER

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70131
Ordered By	:RAY MORRIS	Report Completed	:09/20/93
Project Name	:DEW LINE RI/FS	Collected	:08/24/93 @ 15:10
Project#	:41096-412-01	Received	:08/26/93 @ 12:00
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	:

Sample Remarks: SAMPLE COLLECTED BY: J.P. SEE QC PACKAGE FOR % RECOVERY AND % RSD FOR SPIKES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	I
Semivolatile Organics				EPA 8270				
Phenol	0.023		mg/L	EPA 8270		09/01	09/04	
bis(2-Chloroethyl)ether	0.017	U	mg/L	EPA 8270		09/01	09/04	
2-Chlorophenol	0.062		mg/L	EPA 8270		09/01	09/04	
1,3-Dichlorobenzene	0.017	U	mg/L	EPA 8270		09/01	09/04	
1,4-Dichlorobenzene	0.058		mg/L	EPA 8270		09/01	09/04	
Benzyl Alcohol	0.017	U	mg/L	EPA 8270		09/01	09/04	
1,2-Dichlorobenzene	0.017	U	mg/L	EPA 8270		09/01	09/04	
2-Methylphenol	0.017	U	mg/L	EPA 8270		09/01	09	
bis(2-Chloroisopropyl)e	0.017	U	mg/L	EPA 8270		09/01	09/	
4-Methylphenol	0.017	U	mg/L	EPA 8270		09/01	09/04	
n-Nitroso-di-n-Propylam	0.081		mg/L	EPA 8270		09/01	09/04	
Hexachloroethane	0.017	U	mg/L	EPA 8270		09/01	09/04	
Nitrobenzene	0.017	U	mg/L	EPA 8270		09/01	09/04	
Isophorone	0.017	U	mg/L	EPA 8270		09/01	09/04	
2-Nitrophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	
2,4-Dimethylphenol	0.017	U	mg/L	EPA 8270		09/01	09/04	
Benzoic Acid	0.017	U	mg/L	EPA 8270		09/01	09/04	
bis(2-Chloroethoxy)Meth	0.017	U	mg/L	EPA 8270		09/01	09/04	
2,4-Dichlorophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	
1,2,4-Trichlorobenzene	0.065		mg/L	EPA 8270		09/01	09/04	
Naphthalene	0.017	U	mg/L	EPA 8270		09/01	09/04	
4-Chloroaniline	0.017	U	mg/L	EPA 8270		09/01	09/04	
Hexachlorobutadiene	0.017	U	mg/L	EPA 8270		09/01	09/04	
4-Chloro-3-Methylphenol	0.069		mg/L	EPA 8270		09/01	09/04	
2-Methylnaphthalene	0.017	U	mg/L	EPA 8270		09/01	09/04	
Hexachlorocyclopentadie	0.017	U	mg/L	EPA 8270		09/01	09/04	
2,4,6-Trichlorophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	
2,4,5-Trichlorophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	
2-Chloronaphthalene	0.017	U	mg/L	EPA 8270		09/01	09/04	
2-Nitroaniline	0.017	U	mg/L	EPA 8270		09/01	09/04	
Dimethylphthalate	0.017	U	mg/L	EPA 8270		09/01	09/04	
Acenaphthylene	0.017	U	mg/L	EPA 8270		09/01	09/04	
2,6-Dinitrotoluene	0.017	U	mg/L	EPA 8270		09/01	09/04	
3-Nitroaniline	0.017	U	mg/L	EPA 8270		09/01	09/04	
Acenaphthene	0.075		mg/L	EPA 8270		09/01	09/04	
2,4-Dinitrophenol	0.017	U	mg/L	EPA 8270		09/01	09	

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-2
Client Sample ID :LAY-LF01-SW04 POINT LAY SPIKE
Matrix :WATER

5633 B STR
ANCHORAGE, AK 99
TEL: (907) 562-2
FAX: (907) 561-5

4-Nitrophenol	0.012	J	mg/L	EPA 8270		09/01	09/04	
Dibenzofuran	0.017	U	mg/L	EPA 8270		09/01	09/04	
2,4-Dinitrotoluene	0.086		mg/L	EPA 8270		09/01	09/04	
Diethylphthalate	0.017	U	mg/L	EPA 8270		09/01	09/04	
4-Chlorophenyl-Phenylet	0.017	U	mg/L	EPA 8270		09/01	09/04	
Fluorene	0.017	U	mg/L	EPA 8270		09/01	09/04	
4-Nitroaniline	0.017	U	mg/L	EPA 8270		09/01	09/04	
4,6-Dinitro-2-Methylphe	0.017	U	mg/L	EPA 8270		09/01	09/04	
n-Nitrosodiphenylamine	0.017	U	mg/L	EPA 8270		09/01	09/04	
4-Bromophenyl-Phenyleth	0.017	U	mg/L	EPA 8270		09/01	09/04	
Hexachlorobenzene	0.017	U	mg/L	EPA 8270		09/01	09/04	
Pentachlorophenol	0.020		mg/L	EPA 8270		09/01	09/04	
Phenanthrene	0.017	U	mg/L	EPA 8270		09/01	09/04	
Anthracene	0.017	U	mg/L	EPA 8270		09/01	09/04	
di-n-Butylphthalate	0.067		mg/L	EPA 8270		09/01	09/04	
Fluoranthene	0.017	U	mg/L	EPA 8270		09/01	09/04	
Pyrene	0.091		mg/L	EPA 8270		09/01	09/04	
Butylbenzylphthalate	0.017	U	mg/L	EPA 8270		09/01	09/04	
3,3-Dichlorobenzidine	0.017	U	mg/L	EPA 8270		09/01	09/04	
Benzo(a)Anthracene	0.017	U	mg/L	EPA 8270		09/01	09/04	
Chrysene	0.017	U	mg/L	EPA 8270		09/01	09/04	
bis(2-Ethylhexyl)Phthal	0.017	U	mg/L	EPA 8270		09/01	09/04	
di-n-Octylphthalate	0.017	U	mg/L	EPA 8270		09/01	09/04	
Benzo(b)Fluoranthene	0.017	U	mg/L	EPA 8270		09/01	09/04	
Benzo(k)Fluoranthene	0.017	U	mg/L	EPA 8270		09/01	09/04	
Benzo(a)Pyrene	0.017	U	mg/L	EPA 8270		09/01	09/04	
Indeno(1,2,3-cd)Pyrene	0.017	U	mg/L	EPA 8270		09/01	09/04	
Dibenz(a,h)Anthracene	0.017	U	mg/L	EPA 8270		09/01	09/04	
Benzo(g,h,i)Perylene	0.017	U	mg/L	EPA 8270		09/01	09/04	
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	1.12		mg/L	EPA 6010		09/02	09/06	D
Antimony	0.89		mg/L	EPA 6010		09/02	09/06	D
Arsenic	0.91		mg/L	EPA 6010		09/02	09/06	D
Barium	1.21		mg/L	EPA 6010		09/02	09/06	D
Beryllium	0.39		mg/L	EPA 6010		09/02	09/06	D
Cadmium	0.46		mg/L	EPA 6010		09/02	09/06	D
Calcium	90		mg/L	EPA 6010		09/02	09/06	D
Chromium	0.95		mg/L	EPA 6010		09/02	09/06	D
Cobalt	0.92		mg/L	EPA 6010		09/02	09/06	D
Copper	1.01		mg/L	EPA 6010		09/02	09/06	D
Iron	33		mg/L	EPA 6010		09/02	09/06	D
Lead	0.88		mg/L	EPA 6010		09/02	09/06	D
Magnesium	35		mg/L	EPA 6010		09/02	09/06	D
Manganese	1.92		mg/L	EPA 6010		09/02	09/06	D
Molybdenum	0.93		mg/L	EPA 6010		09/02	09/06	D
Nickel	0.92		mg/L	EPA 6010		09/02	09/06	D
Potassium	18.1		mg/L	EPA 6010		09/02	09/06	D
Selenium	0.91		mg/L	EPA 6010		09/02	09/06	D
Silver	0.088		mg/L	EPA 6010		09/02	09/06	D

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B ST
ANCHORAGE, AK
TEL: (907) 562
FAX: (907) 561

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-2
Client Sample ID :LAY-LF01-SW04 POINT LAY SPIKE
Matrix :WATER

Sodium	---	mg/L	EPA 6010		
Thallium	0.016	mg/L	EPA 7841		09/03 09/08
Vanadium	0.92	mg/L	EPA 6010		09/02 09/06
Zinc	---	mg/L	EPA 6010		
Dissolved Metals Analys	---		-		
ICP Screen, ICF			EPA	n/a	
Aluminum	1.06	mg/L	EPA 6010		09/02 09/06
Antimony	0.90	mg/L	EPA 6010		09/02 09/06
Arsenic	0.92	mg/L	EPA 6010		09/02 09/06
Barium	1.33	mg/L	EPA 6010		09/02 09/06
Beryllium	0.39	mg/L	EPA 6010		09/02 09/06
Cadmium	0.46	mg/L	EPA 6010		09/02 09/06
Calcium	90	mg/L	EPA 6010		09/02 09/06
Chromium	0.95	mg/L	EPA 6010		09/02 09/06
Cobalt	0.92	mg/L	EPA 6010		09/02 09/06
Copper	0.99	mg/L	EPA 6010		09/02 09/06
Iron	23	mg/L	EPA 6010		09/02 09/06
Lead	0.86	mg/L	EPA 6010		09/02 09/06
Magnesium	35	mg/L	EPA 6010		09/02 09/06
Manganese	1.93	mg/L	EPA 6010		09/02 09/06
Molybdenum	0.95	mg/L	EPA 6010		09/02 09/06
Nickel	0.93	mg/L	EPA 6010		09/02 09[illegible]
Potassium	16.7	mg/L	EPA 6010		09/02 09[illegible]
Selenium	0.89	mg/L	EPA 6010		09/02 09/06
Silver	0.087	mg/L	EPA 6010		09/02 09/06
Sodium	---	mg/L	EPA 6010		
Thallium	0.016	mg/L	EPA 7841		09/03 09/08
Vanadium	0.92	mg/L	EPA 6010		09/02 09/06
Zinc	---	mg/L	EPA 6010		

===

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavail[illegible]
NA = Not Ana[illegible]ed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREE
ANCHORAGE, AK 995
TEL: (907) 562-23-
FAX: (907) 561-53(

Chemlab Ref.# :93.4358-6
Client Sample ID :LAY-LF01-SW04 POINT LAY SPIKE DUPLICATE
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70131
Report Completed :09/20/93
Collected :08/24/93 @ 15:10 h
Received :08/26/93 @ 12:00 h
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: J.P. SEE QC PACKAGE FOR SPIKE RECOVERIES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	In
Semivolatile Organics				EPA 8270				
Phenol	0.067		mg/L	EPA 8270		09/01	09/04	M
bis(2-Chloroethyl)ether	0.019	U	mg/L	EPA 8270		09/01	09/04	M
2-Chlorophenol	0.124		mg/L	EPA 8270		09/01	09/04	M
1,3-Dichlorobenzene	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
1,4-Dichlorobenzene	0.084		mg/L	EPA 8270		09/01	09/04	MT
Benzyl Alcohol	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
1,2-Dichlorobenzene	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
2-Methylphenol	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
bis(2-Chloroisopropyl)e	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
4-Methylphenol	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
n-Nitroso-di-n-Propylam	0.126		mg/L	EPA 8270		09/01	09/04	MT
Hexachloroethane	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
Nitrobenzene	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
Isophorone	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
2-Nitrophenol	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
2,4-Dimethylphenol	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
Benzoic Acid	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
bis(2-Chloroethoxy)Meth	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
2,4-Dichlorophenol	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
1,2,4-Trichlorobenzene	0.098		mg/L	EPA 8270		09/01	09/04	MT
Naphthalene	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
4-Chloroaniline	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
Hexachlorobutadiene	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
4-Chloro-3-Methylphenol	0.139		mg/L	EPA 8270		09/01	09/04	MT
2-Methylnaphthalene	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
Hexachlorocyclopentadie	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
2,4,6-Trichlorophenol	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
2,4,5-Trichlorophenol	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
2-Chloronaphthalene	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
2-Nitroaniline	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
Dimethylphthalate	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
Acenaphthylene	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
2,6-Dinitrotoluene	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
3-Nitroaniline	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
Acenaphthene	0.122		mg/L	EPA 8270		09/01	09/04	MT
2,4-Dinitrophenol	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
4-Nitrophenol	0.039		mg/L	EPA 8270		09/01	09/04	MT

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

5633 B STRE
ANCHORAGE, AK 99
TEL: (907) 562-2
FAX: (907) 561-5

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-6
Client Sample ID :LAY-LF01-SW04 POINT LAY SPIKE DUPLICATE
Matrix :WATER

Dibenzofuran	0.019	U	mg/L	EPA 8270	09/01	09/04
2,4-Dinitrotoluene	0.138		mg/L	EPA 8270	09/01	09/04
Diethylphthalate	0.019	U	mg/L	EPA 8270	09/01	09/04
4-Chlorophenyl-Phenylet	0.019	U	mg/L	EPA 8270	09/01	09/04
Fluorene	0.019	U	mg/L	EPA 8270	09/01	09/04
4-Nitroaniline	0.019	U	mg/L	EPA 8270	09/01	09/04
4,6-Dinitro-2-Methylphe	0.019	U	mg/L	EPA 8270	09/01	09/04
n-Nitrosodiphenylamine	0.019	U	mg/L	EPA 8270	09/01	09/04
4-Bromophenyl-Phenyleth	0.019	U	mg/L	EPA 8270	09/01	09/04
Hexachlorobenzene	0.019	U	mg/L	EPA 8270	09/01	09/04
Pentachlorophenol	0.021		mg/L	EPA 8270	09/01	09/04
Phenanthrene	0.019	U	mg/L	EPA 8270	09/01	09/04
Anthracene	0.019	U	mg/L	EPA 8270	09/01	09/04
di-n-Butylphthalate	0.098		mg/L	EPA 8270	09/01	09/04
Fluoranthene	0.019	U	mg/L	EPA 8270	09/01	09/04
Pyrene	0.140		mg/L	EPA 8270	09/01	09/04
Butylbenzylphthalate	0.019	U	mg/L	EPA 8270	09/01	09/04
3,3-Dichlorobenzidine	0.019	U	mg/L	EPA 8270	09/01	09/04
Benzo(a)Anthracene	0.019	U	mg/L	EPA 8270	09/01	09/04
Chrysene	0.019	U	mg/L	EPA 8270	09/01	09/04
bis(2-Ethylhexyl)Phthal	0.019	U	mg/L	EPA 8270	09/01	09/04
di-n-Octylphthalate	0.019	U	mg/L	EPA 8270	09/01	09/04
Benzo(b)Fluoranthene	0.019	U	mg/L	EPA 8270	09/01	09/
Benzo(k)Fluoranthene	0.019	U	mg/L	EPA 8270	09/01	09/
Benzo(a)Pyrene	0.019	U	mg/L	EPA 8270	09/01	09/04
Indeno(1,2,3-cd)Pyrene	0.019	U	mg/L	EPA 8270	09/01	09/04
Dibenz(a,h)Anthracene	0.019	U	mg/L	EPA 8270	09/01	09/04
Benzo(g,h,i)Perylene	0.019	U	mg/L	EPA 8270	09/01	09/04

===

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavaila
NA = Not Anal
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1906

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-11
Client Sample ID :LAY-LF01-SW08 POINT LAY
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70116
Report Completed :10/06/93
Collected :08/24/93 @ 15:15 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.018		mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dichlorodifluoromethane	0.034		mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
cis-1,2-Dichloroethene	0.0069		mg/L	EPA 8260		09/02	09/02	MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Ethylbenzene	0.0041		mg/L	EPA 8260		09/02	09/02	MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
p-Isopropyltoluene	0.0017		mg/L	EPA 8260		09/02	09/02	MCM

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B S[illegible]T
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4356-11
Client Sample ID :LAY-LF01-SW08 POINT LAY
Matrix :WATER

Qualifier/Comments

Methylene Chloride	0.0045		mg/L	EPA 8260	(U)-G.1	09/02	09/02	MC
Napthalene	0.0034		mg/L	EPA 8260	(J)-J.1	09/02	09/02	MC
n-Propylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
Styrene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
Tetrachloroethene	0.082		mg/L	EPA 8260		09/02	09/02	MC
Toluene	0.0072		mg/L	EPA 8260		09/02	09/02	MC
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
Trichloroethene	0.0033		mg/L	EPA 8260		09/02	09/02	MC
Trichlorofluoromethane	0.0029		mg/L	EPA 8260		09/02	09/02	MC
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
1,2,4-Trimethylbenzene	0.010		mg/L	EPA 8260		09/02	09/02	MC
1,3,5-Trimethylbenzene	0.0067		mg/L	EPA 8260		09/02	09/02	MC
Vinyl Chloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
p+m-Xylene	0.013		mg/L	EPA 8260		09/02	09/02	MC
o-Xylene	0.0087		mg/L	EPA 8260		09/02	09/02	MC

OP 2-3-94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyz
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STR
ANCHORAGE, AK 9
TEL: (907) 562-
FAX: (907) 561-

Chemlab Ref.# :93.4358-4
Client Sample ID :LAY-LF01-SW08 POINT LAY
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70131
Report Completed :09/20/93
Collected :08/24/93 @ 15:15
Received :08/26/93 @ 12:00
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: J.P.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date
Semivolatile Organics				EPA 8270			
Phenol	0.011	U	mg/L	EPA 8270		09/01	09/04
bis(2-Chloroethyl)ether	0.011	U	mg/L	EPA 8270		09/01	09/04
2-Chlorophenol	0.011	U	mg/L	EPA 8270		09/01	09/04
1,3-Dichlorobenzene	0.011	U	mg/L	EPA 8270		09/01	09/04
1,4-Dichlorobenzene	0.011	U	mg/L	EPA 8270		09/01	09/04
Benzyl Alcohol	0.011	U	mg/L	EPA 8270		09/01	09/04
1,2-Dichlorobenzene	0.011	U	mg/L	EPA 8270		09/01	09/04
2-Methylphenol	0.011	U	mg/L	EPA 8270		09/01	09/04
bis(2-Chloroisopropyl)e	0.011	U	mg/L	EPA 8270		09/01	09/04
4-Methylphenol	0.011	U	mg/L	EPA 8270		09/01	09/04
n-Nitroso-di-n-Propylam	0.011	U	mg/L	EPA 8270		09/01	09/04
Hexachloroethane	0.011	U	mg/L	EPA 8270		09/01	09/04
Nitrobenzene	0.011	U	mg/L	EPA 8270		09/01	09/04
Isophorone	0.011	U	mg/L	EPA 8270		09/01	09/04
2-Nitrophenol	0.011	U	mg/L	EPA 8270		09/01	09/04
2,4-Dimethylphenol	0.011	U	mg/L	EPA 8270		09/01	09/04
Benzoic Acid	0.011	U	mg/L	EPA 8270		09/01	09/04
bis(2-Chloroethoxy)Meth	0.011	U	mg/L	EPA 8270		09/01	09/04
2,4-Dichlorophenol	0.011	U	mg/L	EPA 8270		09/01	09/04
1,2,4-Trichlorobenzene	0.011	U	mg/L	EPA 8270		09/01	09/04
Naphthalene	0.011	U	mg/L	EPA 8270		09/01	09/04
4-Chloroaniline	0.011	U	mg/L	EPA 8270		09/01	09/04
Hexachlorobutadiene	0.011	U	mg/L	EPA 8270		09/01	09/04
4-Chloro-3-Methylphenol	0.011	U	mg/L	EPA 8270		09/01	09/04
2-Methylnaphthalene	0.011	U	mg/L	EPA 8270		09/01	09/04
Hexachlorocyclopentadie	0.011	U	mg/L	EPA 8270		09/01	09/04
2,4,6-Trichlorophenol	0.011	U	mg/L	EPA 8270		09/01	09/04
2,4,5-Trichlorophenol	0.011	U	mg/L	EPA 8270		09/01	09/04
2-Chloronaphthalene	0.011	U	mg/L	EPA 8270		09/01	09/04
2-Nitroaniline	0.011	U	mg/L	EPA 8270		09/01	09/04
Dimethylphthalate	0.011	U	mg/L	EPA 8270		09/01	09/04
Acenaphthylene	0.011	U	mg/L	EPA 8270		09/01	09/04
2,6-Dinitrotoluene	0.011	U	mg/L	EPA 8270		09/01	09/04
3-Nitroaniline	0.011	U	mg/L	EPA 8270		09/01	09/04
Acenaphthene	0.011	U	mg/L	EPA 8270		09/01	09/04
2,4-Dinitrophenol	0.011	U	mg/L	EPA 8270		09/01	09/04
4-Nitrophenol	0.011	U	mg/L	EPA 8270		09/01	09/04

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B[illegible]ET
ANCHORAGE, A[illegible]518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4358-4
Client Sample ID :LAY-LF01-SW08 POINT LAY
Matrix :WATER

		Qualifier		Comments				
Dibenzofuran	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
2,4-Dinitrotoluene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Diethylphthalate	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
4-Chlorophenyl-Phenylet	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Fluorene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
4-Nitroaniline	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
4,6-Dinitro-2-Methylphe	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
n-Nitrosodiphenylamine	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
4-Bromophenyl-Phenyleth	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Hexachlorobenzene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Pentachlorophenol	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Phenanthrene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Anthracene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
di-n-Butylphthalate	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Fluoranthene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Pyrene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Butylbenzylphthalate	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
3,3-Dichlorobenzidine	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Benzo(a)Anthracene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Chrysene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
bis(2-Ethylhexyl)Phthal	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
di-n-Octylphthalate	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Benzo(b)Fluoranthene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Benzo(k)Fluoranthene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Benzo(a)Pyrene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Indeno(1,2,3-cd)Pyrene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Dibenz(a,h)Anthracene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Benzo(g,h,i)Perylene	0.011	U	mg/L	EPA 8270		09/01	09/04	MT
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Barium	0.20		mg/L	EPA 6010		09/02	09/06	DL
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Calcium	83		mg/L	EPA 6010		09/02	09/06	DL
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Iron	33		mg/L	EPA 6010		09/02	09/06	DL
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Magnesium	25		mg/L	EPA 6010		09/02	09/06	DL
Manganese	0.96		mg/L	EPA 6010		09/02	09/06	DL
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Potassium	8.1		mg/L	EPA 6010		09/02	09/06	DL
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Silver	0.050	U J	mg/L	J.1 EPA 6010		09/02	09/06	DL
Sodium	47		mg/L	EPA 6010		09/15	09/17	DF

All changes
A.C
2/3/94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4358-4
Client Sample ID :LAY-LF01-SW08 POINT LAY
Matrix :WATER

Qualifier Comment

Thallium	0.005	U		mg/L		EPA 7841		09/03 09/08	BI
Vanadium	0.050	U		mg/L		EPA 6010		09/02 09/06	DI
Zinc	0.050	U		mg/L		EPA 6010		09/15 09/17	DF
Dissolved Metals Analys	---					-			
ICP Screen, ICF						EPA	n/a		
Aluminum	0.10	U		mg/L		EPA 6010		09/02 09/06	DI
Antimony	0.10	U		mg/L		EPA 6010		09/02 09/06	DI
Arsenic	0.10	U		mg/L		EPA 6010		09/02 09/06	DI
Barium	0.21			mg/L		EPA 6010		09/02 09/06	DI
Beryllium	0.050	U		mg/L		EPA 6010		09/02 09/06	DI
Cadmium	0.050	U		mg/L		EPA 6010		09/02 09/06	DI
Calcium	83			mg/L		EPA 6010		09/02 09/06	DI
Chromium	0.050	U		mg/L		EPA 6010		09/02 09/06	DI
Cobalt	0.10	U		mg/L		EPA 6010		09/02 09/06	DI
Copper	0.050	U		mg/L		EPA 6010		09/02 09/06	DI
Iron	23			mg/L		EPA 6010		09/02 09/06	DI
Lead	0.10	U		mg/L		EPA 6010		09/02 09/06	DI
Magnesium	25			mg/L		EPA 6010		09/02 09/06	DI
Manganese	0.96			mg/L		EPA 6010		09/02 09/06	DI
Molybdenum	0.050	U		mg/L		EPA 6010		09/02 09/06	DI
Nickel	0.050	U		mg/L		EPA 6010		09/02 09/06	DI
Potassium	8.3			mg/L		EPA 6010		09/02 09/06	DI
Selenium	0.10	U		mg/L		EPA 6010		09/02 09/06	DI
Silver	0.050	U	J	mg/L	J.1	EPA 6010		09/02 09/06	DI
Sodium	47			mg/L		EPA 6010		09/15 09/17	DF
Thallium	0.005	U		mg/L		EPA 7841		09/03 09/08	B
Vanadium	0.050	U		mg/L		EPA 6010		09/02 09/06	D
Zinc	0.050	U		mg/L		EPA 6010		09/15 09/17	D
TOC, Nonpurgable						EPA 9060	n/a		
...TOC Range	19.8-20.9			mg/L		EPA 9060		09/07	C
...TOC Concentration	20.4			mg/L		EPA 9060		09/07	C
Residue, Non-Filterable	84			mg/L		EPA 160.2		08/31	T
Residue,Filterable(TDS)	870		J	mg/L	A.1	EPA 160.1	500	09/01 09/02	R

All charges A.C
2/3/94

Compiled: SMF 11/29/94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-9
Client Sample ID :LAY-LF01-2SW09
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 17:30 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : C. Vonerteal

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL. **THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons VPH	0.223		mg/L	EPA 5030/8015M		09/13	09/13	WLS
Hydrocarbons EPH	0.181		mg/L	3510/3550/8100M		09/13	09/15	JBH
Volatile Organics				EPA 8260				
Benzene	0.013		mg/L	EPA 8260		09/20	09/20	KWM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromoform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloromethane	0.0035	B	mg/L	EPA 8260		09/20	09/20	KWM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
12Dibromo3Chloropropane	**		mg/L	EPA 8260				
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dichlorodifluoromethane	0.058		mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
cis-1,2-Dichloroethene	0.0055		mg/L	EPA 8260		09/20	09/20	KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-9
Client Sample ID :LAY-LF01-2SW09
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Ethylbenzene	0.0036		mg/L	EPA 8260	09/20	09/20	KWM
Hexachlorobutadiene	**		mg/L	EPA 8260			
Isopropylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
p-Isopropyltoluene	0.0013		mg/L	EPA 8260	09/20	09/20	KWM
Methylene Chloride	0.0026		mg/L	EPA 8260	09/20	09/20	KWM
Napthalene	**		mg/L	EPA 8260			
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Styrene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Tetrachloroethene	0.109		mg/L	EPA 8260	09/20	09/20	KWM
Toluene	0.0089		mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichlorobenzene	**		mg/L	EPA 8260			
1,2,4-Trichlorobenzene	**		mg/L	EPA 8260			
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Trichloroethene	0.0029		mg/L	EPA 8260	09/20	09/20	KWM
Trichlorofluoromethane	0.0038		mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,4-Trimethylbenzene	0.0093		mg/L	EPA 8260	09/20	09/20	KWM
1,3,5-Trimethylbenzene	0.0051		mg/L	EPA 8260	09/20	09/20	KWM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
p+m-Xylene	0.013		mg/L	EPA 8260	09/20	09/20	KWM
o-Xylene	0.0077		mg/L	EPA 8260	09/20	09/20	KWM

* See Special Instructions Above
See Sample Remarks Above
= Undetected. Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-10
Client Sample ID :LAY-LF01-2SW10
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 17:45 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL. **THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons VPH	0.020	U	mg/L	EPA 5030/8015M		09/13	09/13	WLS
Hydrocarbons EPH	0.240		mg/L	3510/3550/8100M		09/13	09/16	JBH
Volatile Organics				EPA 8260				
Benzene	0.0011		mg/L	EPA 8260		09/20	09/20	[illegible]M
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	[illegible]M
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromoform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloromethane	0.0083	B	mg/L	EPA 8260		09/20	09/20	KWM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
12Dibromo3Chloropropane	**		mg/L	EPA 8260				
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-10
Client Sample ID :LAY-LF01-2SW10
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Ethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Hexachlorobutadiene	**		mg/L	EPA 8260			
Isopropylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Methylene Chloride	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Napthalene	**		mg/L	EPA 8260			
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Styrene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Toluene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichlorobenzene	**		mg/L	EPA 8260			
1,2,4-Trichlorobenzene	**		mg/L	EPA 8260			
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Trichloroethene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

ICF ID	LAY-LF01-SD01	LAY-LF01-SD02	LAY-LF01-SD03	LAY-LF01-SD04
F&BI Number	478	480	482	484
Sample Type	soil	soil	soil	soil
Date Received	8/24/93	8/24/93	8/24/93	8/24/93
% Dry Weight	32	26	94	85
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/25/93
Leaded Gas				
JP-4	<150	<200	<50	<60
Lube Oil	<300	<400	<100	<120
Diesel	~~<150~~ <160	~~<200~~ <190	<50	<60
Spike Level				
Unknown Semi-volatile				
Pentacosane	106	102	97	97
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/25/93
PCB 1221	~~<0.1~~ <0.3	~~<0.1~~ <0.4	<0.1	<0.1
PCB 1232	~~<0.1~~ <0.3	~~<0.1~~ <0.4	<0.1	<0.1
PCB 1016	~~<0.1~~ <0.3	~~<0.1~~ <0.4	<0.1	<0.1
PCB 1242	~~<0.1~~ <0.3	~~<0.1~~ <0.4	<0.1	<0.1
PCB 1248	~~<0.1~~ <0.3	~~<0.1~~ <0.4	<0.1	<0.1
PCB 1254	~~<0.1~~ <0.3	~~<0.1~~ <0.4	<0.1	<0.1
PCB 1260	~~<0.1~~ <0.3	~~<0.1~~ <0.4	<0.1	<0.1
Spike Level				
Dibutyl Chlorendate	106	102	97	97
Sequence Date				#5-08/25/93
alpha-BHC				<0.02
beta-BHC				<0.02
gamma-BHC				<0.02
delta-BHC				<0.02
Heptachlor				<0.02
Aldrin				<0.02
Heptachlor Epoxide				<0.02
Endosulfan I				<0.02
DDE				<0.02
Dieldrin				<0.02
Endrin				<0.02
Endosulfan II				<0.02
DDD				<0.02
Endrin Aldehyde				<0.02
DDT				<0.02
Endosulfan Sulfate				<0.02
Endrin Ketone				<0.02
Methoxy Chlor				<0.1
Chlordane				<0.5
Dibutyl Chlorendate				97
Spike Level				
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93
CCl4	<0.07 J	<0.07 J	<0.02 J	<0.03 J
TCA	<0.07 J	<0.07 J	<0.02 J	<0.03 J
Benzene	<0.07	<0.07	<0.02	<0.03
TCE	<0.07 J	<0.07 J	<0.02 J	<0.03 J
Toluene	~~<0.07~~ <0.6	<0.07	<0.02	0.03
PCE	<0.07 J	<0.07 J	<0.02 J	<0.03 J
Ethylbenzene	~~<0.07~~ <1.2	<0.07	<0.02	<0.03
Xylenes	~~<0.14~~ <1.3	~~<0.14~~ <0.4	<0.04	<0.06
Gasoline	~~<5~~ <32 J	~~<7~~ <4 J	~~<4~~ <1 J	~~<3~~ <1 J
Spike level				
BFB	119	89	89	91

RJB
6-14-95

ICF ID	LAY-LF01-SD05	LAY-LF01-SD06	LAY-LF01-SD07	LAY-LF01-SD08
F&BI Number	486	488	490	492
Sample Type	soil	soil	soil	soil
Date Received	8/24/93	8/24/93	8/24/93	8/24/93
% Dry Weight	89	61	88	60
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/25/93
Leaded Gas				
JP-4	<60	<100	<60	<100
Lube Oil	<120	<200	<120	<200
Diesel	<60 R	~~<100~~ <80	<60	<100
Spike Level				
Unknown Semi-volatile				
Pentacosane	97	95	98	101
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/25/93
PCB 1221	<0.1	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.2
PCB 1232	<0.1	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.2
PCB 1016	<0.1	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.2
PCB 1242	<0.1	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.2
PCB 1248	<0.1	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.2
PCB 1254	<0.1	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.2
PCB 1260	<0.1	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.2
Spike Level				
Dibutyl Chlorendate	97	95	98	101
Sequence Date				#5-08/25/93
alpha-BHC				<0.02
beta-BHC				<0.02
gamma-BHC				<0.02
delta-BHC				<0.02
Heptachlor				<0.02
Aldrin				<0.02
Heptachlor Epoxide				<0.02
Endosulfan I				<0.02
DDE				<0.02
Dieldrin				<0.02
Endrin				<0.02
Endosulfan II				<0.02
DDD				<0.02
Endrin Aldehyde				<0.02
DDT				<0.02
Endosulfan Sulfate				<0.02
Endrin Ketone				<0.02
Methoxy Chlor				<0.1
Chlordane				<0.5
Dibutyl Chlorendate				101
Spike Level				
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93
CCl4	<0.03 J	<0.04 J	<0.03 J	<0.04 J
TCA	<0.03 J	<0.04 J	<0.03 J	<0.04 J
Benzene	<0.03	<0.04	<0.03	<0.04
TCE	<0.03 J	<0.04 J	<0.03 J	<0.04 J
Toluene	<0.03	<0.04	<0.03	<0.04
PCE	<0.03 J	<0.04 J	<0.03 J	0.4 J
Ethylbenzene	<0.03	<0.04	<0.03	<0.04
Xylenes	<0.06	<0.08	<0.06	<0.08
Gasoline	~~<3~~ <1 J	~~<4~~ <2 J	~~<3~~ <1 J	~~<4~~ <2 J
Spike level				
BFB	96	82	84	87

RJJ
6-14-95

ICF ID	LAY-LF01-SD09	LAY-LF01-SD10	LAY-LF01-SD11	LAY-LF01-SW01
F&BI Number	494	496	498	559
Sample Type	soil	soil	soil	water
Date Received	8/24/93	8/24/93	8/24/93	8/25/93
% Dry Weight	50	83	12	
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/27/93
Leaded Gas				
JP-4	<100	<60	<400	<1000
Lube Oil	<200	<120	<800	<2000
Diesel	<100	<60	<400	<1000
Spike Level				
Unknown Semi-volatile				
Pentacosane	99	100	106	78
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/27/93
PCB 1221	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.8	<2
PCB 1232	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.8	<2
PCB 1016	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.8	<2
PCB 1242	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.8	<2
PCB 1248	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.8	<2
PCB 1254	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.8	<2
PCB 1260	~~<0.1~~ <0.2	<0.1	~~<0.1~~ <0.8	<2
Spike Level				
Dibutyl Chlorendate	99	100	106	78
Sequence Date				
alpha-BHC				
beta-BHC				
gamma-BHC				
delta-BHC				
Heptachlor				
Aldrin				
Heptachlor Epoxide				
Endosulfan I				
DDE				
Dieldrin				
Endrin				
Endosulfan II				
DDD				
Endrin Aldehyde				
DDT				
Endosulfan Sulfate				
Endrin Ketone				
Methoxy Chlor				
Chlordane				
Dibutyl Chlorendate				
Spike Level				
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93	
CCl4	<0.05 J	<0.03 J	<0.2 J	
TCA	<0.05 J	<0.03 J	<0.2 J	
Benzene	<0.05	<0.03	<0.2	
TCE	<0.05 J	<0.03 J	<0.2 J	
Toluene	<0.05	<0.03	<0.2	
PCE	<0.05 J	<0.03 J	<0.2 J	
Ethylbenzene	<0.05	<0.03	<0.2	
Xylenes	<0.1	<0.06	<0.4	
Gasoline	~~<5~~ <2 J	~~<3~~ <1 J	~~<20~~ <8 J	
Spike level				
BFB	90	93	85	

RSB
6-14-95

ICF ID	LAY-LF01-SW01	LAY-LF01-SW02	LAY-LF01-SW02	LAY-LF01-SW03
F&BI Number	592	560	597	561
Sample Type	water	water	water	water
Date Received	8/25/93	8/25/93	8/25/93	8/25/93
% Dry Weight				
Sequence Date		#5-08/27/93		#5-08/27/93
Leaded Gas				
JP-4		<1000		<1000
Lube Oil		<2000		<2000
Diesel		<1000		<1000
Spike Level				
Unknown Semi-volatile				
Pentacosane		84		93
Sequence Date		#5-08/27/93		#5-08/27/93
PCB 1221		<2		<2
PCB 1232		<2		<2
PCB 1016		<2		<2
PCB 1242		<2		<2
PCB 1248		<2		<2
PCB 1254		<2		<2
PCB 1260		<2		<2
Spike Level				
Dibutyl Chlorendate		84		93
Sequence Date				
alpha-BHC				
beta-BHC				
gamma-BHC				
delta-BHC				
Heptachlor				
Aldrin				
Heptachlor Epoxide				
Endosulfan I				
DDE				
Dieldrin				
Endrin				
Endosulfan II				
DDD				
Endrin Aldehyde				
DDT				
Endosulfan Sulfate				
Endrin Ketone				
Methoxy Chlor				
Chlordane				
Dibutyl Chlorendate				
Spike Level				
Vol Sequence	#3&4-08/25/93		#3&4-08/25/93	
CCl4	<1		<1	
TCA	<1		<1	
Benzene	<1		<1	
TCE	<1		<1	
Toluene	<1		<1	
PCE	<1		<1	
Ethylbenzene	<1		<1	
Xylenes	<2		<2	
Gasoline	~~<50~~ <100 J		~~<50~~ <100 J	
Spike level				
BFB	93		96	

RJO
6-14-95

ICF ID	LAY-LF01-SW03	LAY-LF01-SW04	LAY-LF01-SW04	LAY-LF01-SW05
F&BI Number	598	562	601	563
Sample Type	water	water	water	water
Date Received	8/25/93	8/25/93	8/25/93	8/25/93
% Dry Weight				
Sequence Date		#5-08/27/93		#5-08/27/93
Leaded Gas				
JP-4		<1000		<1000
Lube Oil		<2000		<2000
Diesel		<1000		<1000
Spike Level				
Unknown Semi-volatile				
Pentacosane		89		100
Sequence Date		#5-08/27/93		#5-08/27/93
PCB 1221		<2		<2
PCB 1232		<2		<2
PCB 1016		<2		<2
PCB 1242		<2		<2
PCB 1248		<2		<2
PCB 1254		<2		<2
PCB 1260		<2		<2
Spike Level				
Dibutyl Chlorendate		89		100
Sequence Date		#5-08/27/93		
alpha-BHC		~~<2~~ <0.2 J		
beta-BHC		~~<2~~ <0.2 J		
gamma-BHC		~~<2~~ <0.2 J		
delta-BHC		~~<2~~ <0.2 J		
Heptachlor		~~<2~~ <0.2 J		
Aldrin		~~<2~~ <0.2 J		
Heptachlor Epoxide		~~<2~~ <0.2 J		
Endosulfan I		~~<2~~ <0.2 J		
DDE		~~<2~~ <0.2 J		
Dieldrin		~~<2~~ <0.2 J		
Endrin		~~<2~~ <0.2 J		
Endosulfan II		~~<2~~ <0.2 J		
DDD		~~<2~~ <0.2 J		
Endrin Aldehyde		~~<2~~ <0.2 J		
DDT		~~<2~~ <0.2 J		
Endosulfan Sulfate		~~<2~~ <0.2 J		
Endrin Ketone		~~<2~~ <0.2 J		
Methoxy Chlor		~~<20~~ <10 J		
Chlordane		~~<50~~ <10 J		
Dibutyl Chlorendate		89		
Spike Level				
Vol Sequence	#3&4-08/25/93		#3&4-08/25/93	
CCl4	<1		<1	
TCA	<1		<1	
Benzene	<1		23	
TCE	<1		<1	
Toluene	<1		9	
PCE	<1		93	
Ethylbenzene	<1		10 J	
Xylenes	<2		20 J	
Gasoline	~~<50~~ <100 J		~~<50~~ <100 J	
Spike level				
BFB	113		96	

RJB
6-14-95

ICF ID	LAY-LF01-SW05	LAY-LF01-SW06	LAY-LF01-SW06	LAY-LF01-SW06
F&BI Number	604	564	608 dup	609
Sample Type	water	water	water	water
Date Received	8/25/93	8/25/93	8/25/93	8/25/93
% Dry Weight				
Sequence Date		#5-08/27/93		
Leaded Gas				
JP-4		<1000		
Lube Oil		<2000		
Diesel		<1000		
Spike Level				
Unknown Semi-volatile				
Pentacosane		98		
Sequence Date		#5-08/27/93		
PCB 1221		<2		
PCB 1232		<2		
PCB 1016		<2		
PCB 1242		<2		
PCB 1248		<2		
PCB 1254		<2		
PCB 1260		<2		
Spike Level				
Dibutyl Chlorendate		98		
Sequence Date				
alpha-BHC				
beta-BHC				
gamma-BHC				
delta-BHC				
Heptachlor				
Aldrin				
Heptachlor Epoxide				
Endosulfan I				
DDE				
Dieldrin				
Endrin				
Endosulfan II				
DDD				
Endrin Aldehyde				
DDT				
Endosulfan Sulfate				
Endrin Ketone				
Methoxy Chlor				
Chlordane				
Dibutyl Chlorendate				
Spike Level				
Vol Sequence	#3&4-08/25/93		#3&4-08/25/93	#3&4-08/25/93
CCl4	<1		<1	<1
TCA	<1		<1	<1
Benzene	<1		<1	<1
TCE	<1		<1	<1
Toluene	<1		<1	<1
PCE	<1		<1	<1
Ethylbenzene	<1		<1	<1
Xylenes	<2		<2	<2
Gasoline	~~<50~~ <100 J		~~<50~~ <100 J	~~<50~~ <100 J
Spike level				
BFB	88		89	98

RJB
6-14-95

ICF ID	LAY-LF01-SW07	LAY-LF01-SW07	LAY-LF01-SW08	LAY-LF01-SW08
F&BI Number	565	612	566	613
Sample Type	water	water	water	water
Date Received	8/25/93	8/25/93	8/25/93	8/25/93
% Dry Weight				
Sequence Date	#5-08/27/93		#5-08/27/93	
Leaded Gas				
JP-4	<1000		<1000	
Lube Oil	<2000		<2000	
Diesel	<1000 J		<1000 J	
Spike Level				
Unknown Semi-volatile				
Pentacosane	110		109	
Sequence Date	#5-08/27/93		#5-08/27/93	
PCB 1221	<2		<2	
PCB 1232	<2		<2	
PCB 1016	<2		<2	
PCB 1242	<2		<2	
PCB 1248	<2		<2	
PCB 1254	<2		<2	
PCB 1260	<2		<2	
Spike Level				
Dibutyl Chlorendate	110		109	
Sequence Date			#5-08/27/93	
alpha-BHC			~~<2~~ <0.2 J	
beta-BHC			~~<2~~ <0.2 J	
gamma-BHC			~~<2~~ <0.2 J	
delta-BHC			~~<2~~ <0.2 J	
Heptachlor			~~<2~~ <0.2 J	
Aldrin			~~<2~~ <0.2 J	
Heptachlor Epoxide			~~<2~~ <0.2 J	
Endosulfan I			~~<2~~ <0.2 J	
DDE			~~<2~~ <0.2 J	
Dieldrin			~~<2~~ <0.2 J	
Endrin			~~<2~~ <0.2 J	
Endosulfan II			~~<2~~ <0.2 J	
DDD			~~<2~~ <0.2 J	
Endrin Aldehyde			~~<2~~ <0.2 J	
DDT			~~<2~~ <0.2 J	
Endosulfan Sulfate			~~<2~~ <0.2 J	
Endrin Ketone			~~<2~~ <0.2 J	
Methoxy Chlor			~~<20~~ <10 J	
Chlordane			~~<50~~ <10 J	
Dibutyl Chlorendate			110	
Spike Level				
Vol Sequence		#3&4-08/25/93		#3&4-08/25/93
CCl4		<1		<1
TCA		<1		<1
Benzene		<1		20
TCE		<1		<1
Toluene		<1		7
PCE		<1		80
Ethylbenzene		<1		13 J
Xylenes		<2		20 J
Gasoline		~~<50~~ <100 J		~~<50~~ <100 J
Spike level				
BFB		96		92

RJB 6-14-95

ANALYTICAL DATA SHEETS FOR GARAGE (SS06)

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-4
Client Sample ID :LAY-SS06-S03 POINT LAY
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70106
Report Completed :10/07/93
Collected :08/24/93 @ 11:50 hrs
Received :08/26/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : Steph C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

Analysis/Comments

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.020	U	mg/Kg	EPA 8260 (J) - A.1		08/26	09/13	KWM
Bromobenzene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromochloromethane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromodichloromethane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromoform	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromomethane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
n-Butylbenzene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
sec-Butylbenzene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
tert-Butylbenzne	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Carbon Tetrachloride	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chlorobenzene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloroethane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloroform	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloromethane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
2-Chlorotoluene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
4-Chlorotoluene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromochloromethane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
12Dibromo3Chloropropane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dibromoethane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromomethane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,4-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dichlorodifluoromethane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloroethane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
cis-1,2-Dichloroethene	0.022		mg/Kg	EPA 8260		08/26	09/13	KWM
trans1,2-Dichloroethene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloropropane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichloropropane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
2,2-Dichloropropane	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloropropene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Ethylbenzene	0.023		mg/Kg	EPA 8260		08/26	09/13	KWM
Hexachlorobutadiene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Isopropylbenzene	0.020	U	mg/Kg	EPA 8260		08/26	09/13	KWM
p-Isopropyltoluene	0.042		mg/Kg	EPA 8260		08/26	09/13	KWM

al 2-2-94

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-4
Client Sample ID :LAY-SS06-S03 POINT LAY
Matrix :SOIL

Qualifier/Comments

Methylene Chloride	0.023		mg/Kg	EPA 8260(J) -A.1	08/26	09/13	KWM
Napthalene	0.158		mg/Kg	EPA 8260	08/26	09/13	KWM
n-Propylbenzene	0.020	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Styrene	0.020	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1112-Tetrachloroethane	0.020	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1122-Tetrachloroethane	0.020	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Tetrachloroethene	0.359		mg/Kg	EPA 8260	08/26	09/13	KWM
Toluene	0.094		mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,3-Trichlorobenzene	0.020	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,4-Trichlorobenzene	0.020	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,1,1-Trichloroethane	0.020	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,1,2-Trichloroethane	0.020	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Trichloroethene	0.020	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Trichlorofluoromethane	0.020	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,3-Trichloropropane	0.020	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,4-Trimethylbenzene	0.315		mg/Kg	EPA 8260	08/26	09/13	KWM
1,3,5-Trimethylbenzene	0.497		mg/Kg	EPA 8260	08/26	09/13	KWM
Vinyl Chloride	0.020	U	mg/Kg	EPA 8260	08/26	09/13	KWM
p+m-Xylene	0.366		mg/Kg	EPA 8260	08/26	09/13	KWM
o-Xylene	0.483		mg/Kg	EPA 8260	08/26	09/13	KWM
Semivolatile Organics				EPA 8270			
Phenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	T
bis(2-Chloroethyl)ether	2.20	U	mg/Kg	EPA 8270	09/06	09/30	T
2-Chlorophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,3-Dichlorobenzene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,4-Dichlorobenzene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzyl Alcohol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,2-Dichlorobenzene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Methylphenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroisopropyl)e	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Methylphenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
n-Nitroso-di-n-Propylam	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachloroethane	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Nitrobenzene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Isophorone	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Nitrophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dimethylphenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzoic Acid	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroethoxy)Meth	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dichlorophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,2,4-Trichlorobenzene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Naphthalene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chloroaniline	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorobutadiene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chloro-3-Methylphenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Methylnaphthalene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorocyclopentadie	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4,6-Trichlorophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4,5-Trichlorophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Chloronaphthalene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	T

CR 2-2-94

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS XL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-4
Client Sample ID :LAY-SS06-S03 POINT LAY
Matrix :SOIL

		Qualifier		Comment				
2-Nitroaniline	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Dimethylphthalate	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Acenaphthylene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
2,6-Dinitrotoluene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
3-Nitroaniline	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Acenaphthene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
2,4-Dinitrophenol	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
4-Nitrophenol	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Dibenzofuran	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
2,4-Dinitrotoluene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Diethylphthalate	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
4-Chlorophenyl-Phenylet	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Fluorene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
4-Nitroaniline	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
4,6-Dinitro-2-Methylphe	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
n-Nitrosodiphenylamine	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
4-Bromophenyl-Phenyleth	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Hexachlorobenzene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Pentachlorophenol	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Phenanthrene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Anthracene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
di-n-Butylphthalate	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Fluoranthene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Pyrene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Butylbenzylphthalate	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
3,3-Dichlorobenzidine	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Benzo(a)Anthracene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Chrysene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
bis(2-Ethylhexyl)Phthal	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
di-n-Octylphthalate	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Benzo(b)Fluoranthene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Benzo(k)Fluoranthene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Benzo(a)Pyrene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Indeno(1,2,3-cd)Pyrene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Dibenz(a,h)Anthracene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Benzo(g,h,i)Perylene	2.20	U	mg/Kg		EPA 8270	09/06	09/30	MTT
Sample Preparation	---				EPA 3050 Digest			
Total Metals Analysis	---							
ICP Screen, ICF					EPA n/a			
Aluminum	2300		mg/Kg		EPA 6010	08/31	09/02	DFL
Antimony	63	U J	mg/Kg	J.3	EPA 6010	08/31	09/02	DFL
Arsenic	63	U	mg/Kg		EPA 6010	08/31	09/02	DFL
Barium	290		mg/Kg		EPA 6010	08/31	09/02	DFL
Beryllium	32	U	mg/Kg		EPA 6010	08/31	09/02	DFL
Cadmium	32	U	mg/Kg		EPA 6010	08/31	09/02	DFL
Calcium	2000		mg/Kg		EPA 6010	08/31	09/02	DFL
Chromium	21		mg/Kg		EPA 6010	08/31	09/02	DFL
Cobalt	6.3	U	mg/Kg		EPA 6010	08/31	09/02	DFL
Copper	32	U	mg/Kg		EPA 6010	08/31	09/02	DFL

All chgs J.L 2/2/94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B ST
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-4
Client Sample ID :LAY-SS06-S03 POINT LAY
Matrix :SOIL

Qualifier | Comment

Iron	14000		mg/Kg		EPA 6010	08/31	09/02	DFL
Lead	92		mg/Kg		EPA 6010	08/31	09/02	DFL
Magnesium	1300		mg/Kg		EPA 6010	08/31	09/02	DFL
Manganese	160	J	mg/Kg	J.3	EPA 6010	08/31	09/02	DFL
Molybdenum	32	U	mg/Kg		EPA 6010	08/31	09/02	DFL
Nickel	16		mg/Kg		EPA 6010	08/31	09/02	DFL
Potassium	430	s.c	mg/Kg		EPA 6010	08/31	09/06	DLG
Selenium	63	U ~~J~~	mg/Kg	~~J.3~~ s.c	EPA 6010	08/31	09/02	DFL
Silver	32	U R	mg/Kg	S.1	EPA 6010	08/31	09/02	DFL
Sodium	250		mg/Kg		EPA 6010	08/31	09/06	DLG
Thallium	0.31	U	mg/Kg		EPA 7841	08/30	09/01	KAW
Vanadium	13		mg/Kg		EPA 6010	08/31	09/02	DFL
Zinc	85		mg/Kg		EPA 6010	08/31	09/02	DFL

All changes s.c 2/3/94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-5
Client Sample ID :LAY-SS06-S08 POINT LAY
Matrix :SOIL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70106
Report Completed :10/07/93
Collected :08/24/93 @ 15:05 hrs
Received :08/26/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromobenzene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromochloromethane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromodichloromethane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromoform	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromomethane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
n-Butylbenzene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
sec-Butylbenzene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
tert-Butylbenzne	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Carbon Tetrachloride	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chlorobenzene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloroethane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloroform	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloromethane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
2-Chlorotoluene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
4-Chlorotoluene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromochloromethane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
12Dibromo3Chloropropane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dibromoethane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromomethane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichlorobenzene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichlorobenzene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,4-Dichlorobenzene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dichlorodifluoromethane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloroethane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
cis-1,2-Dichloroethene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
trans1,2-Dichloroethene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloropropane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichloropropane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
2,2-Dichloropropane	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloropropene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Ethylbenzene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Hexachlorobutadiene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Isopropylbenzene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM
p-Isopropyltoluene	0.100	U	mg/Kg	EPA 8260		08/26	09/13	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-5
Client Sample ID :LAY-SS06-S08 POINT LAY
Matrix :SOIL

Methylene Chloride	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Napthalene	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
n-Propylbenzene	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Styrene	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1112-Tetrachloroethane	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1122-Tetrachloroethane	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Tetrachloroethene	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Toluene	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,3-Trichlorobenzene	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,4-Trichlorobenzene	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,1,1-Trichloroethane	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,1,2-Trichloroethane	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Trichloroethene	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Trichlorofluoromethane	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,3-Trichloropropane	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,2,4-Trimethylbenzene	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
1,3,5-Trimethylbenzene	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Vinyl Chloride	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
p+m-Xylene	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
o-Xylene	0.100	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Semivolatile Organics				EPA 8270			
Phenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroethyl)ether	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Chlorophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,3-Dichlorobenzene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,4-Dichlorobenzene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzyl Alcohol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,2-Dichlorobenzene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Methylphenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroisopropyl)e	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Methylphenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
n-Nitroso-di-n-Propylam	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachloroethane	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Nitrobenzene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Isophorone	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Nitrophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dimethylphenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzoic Acid	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Chloroethoxy)Meth	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dichlorophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
1,2,4-Trichlorobenzene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Naphthalene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chloroaniline	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorobutadiene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chloro-3-Methylphenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Methylnaphthalene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorocyclopentadie	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4,6-Trichlorophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4,5-Trichlorophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Chloronaphthalene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-5
Client Sample ID :LAY-SS06-S08 POINT LAY
Matrix :SOIL

2-Nitroaniline	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Dimethylphthalate	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Acenaphthylene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,6-Dinitrotoluene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
3-Nitroaniline	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Acenaphthene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dinitrophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Nitrophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Dibenzofuran	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dinitrotoluene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Diethylphthalate	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chlorophenyl-Phenylet	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Fluorene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Nitroaniline	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4,6-Dinitro-2-Methylphe	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
n-Nitrosodiphenylamine	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Bromophenyl-Phenyleth	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorobenzene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Pentachlorophenol	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Phenanthrene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Anthracene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
di-n-Butylphthalate	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Fluoranthene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Pyrene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Butylbenzylphthalate	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
3,3-Dichlorobenzidine	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(a)Anthracene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Chrysene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Ethylhexyl)Phthal	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
di-n-Octylphthalate	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(b)Fluoranthene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(k)Fluoranthene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(a)Pyrene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Indeno(1,2,3-cd)Pyrene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Dibenz(a,h)Anthracene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(g,h,i)Perylene	2.20	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Sample Preparation	---			EPA 3050 Digest			
Total Metals Analysis	---			-			
ICP Screen, ICP				EPA	n/a		
Aluminum	2100		mg/Kg	EPA 6010	08/31	09/02	DFL
Antimony	50	U	mg/Kg	EPA 6010	08/31	09/02	DFL
Arsenic	50	U	mg/Kg	EPA 6010	08/31	09/02	DFL
Barium	280		mg/Kg	EPA 6010	08/31	09/02	DFL
Beryllium	25	U	mg/Kg	EPA 6010	08/31	09/02	DFL
Cadmium	25	U	mg/Kg	EPA 6010	08/31	09/02	DFL
Calcium	1500		mg/Kg	EPA 6010	08/31	09/02	DFL
Chromium	54		mg/Kg	EPA 6010	08/31	09/02	DFL
Cobalt	5.0	U	mg/Kg	EPA 6010	08/31	09/02	DFL
Copper	25	U	mg/Kg	EPA 6010	08/31	09/02	DFL

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-5
Client Sample ID :LAY-SS06-S08 POINT LAY
Matrix :SOIL

Iron	20000		mg/Kg	EPA 6010	08/31	09/02	DFL
Lead	195		mg/Kg	EPA 6010	08/31	09/02	DFL
Magnesium	1200		mg/Kg	EPA 6010	08/31	09/02	DFL
Manganese	270		mg/Kg	EPA 6010	08/31	09/02	DFL
Molybdenum	25	U	mg/Kg	EPA 6010	08/31	09/02	DFL
Nickel	12		mg/Kg	EPA 6010	08/31	09/02	DFL
Potassium	410		mg/Kg	EPA 6010	08/31	09/02	DFL
Selenium	50	U	mg/Kg	EPA 6010	08/31	09/06	DLG
Silver	25	U	mg/Kg	EPA 6010	08/31	09/02	DFL
Sodium	81		mg/Kg	EPA 6010	08/31	09/06	DLG
Thallium	0.27	U	mg/Kg	EPA 7841	08/30	09/01	KAW
Vanadium	12		mg/Kg	EPA 6010	08/31	09/02	DFL
Zinc	59		mg/Kg	EPA 6010	08/31	09/02	DFL

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1909

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-14
Client Sample ID :LAY-SS06-2S12
Matrix :SOIL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 15:20 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. 2500 MG/KG OF EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Qualifier/Comments

Parameter	Results	QC Qual	Units	Method	~~Allowable~~ Limits	Ext. Date	Anal Date	Init
Percent Solids	88.2		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	2900	D	mg/Kg	3510/3550/8100M (J) - K.1		09/14	09/21	JBH
Hydrocarbons VPH	172	D	mg/Kg	EPA 5030/8015M		09/10	09/18	WLS
Volatile Organics				EPA 8260				
Benzene	2.00	U	mg/Kg	EPA 8260 (J) - A.1		09/10	10/01	KWM
Bromobenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromochloromethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromodichloromethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromoform	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromomethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
n-Butylbenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
sec-Butylbenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
tert-Butylbenzne	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Carbon Tetrachloride	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chlorobenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloroethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloroform	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloromethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
2-Chlorotoluene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
4-Chlorotoluene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dibromochloromethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
12Dibromo3Chloropropane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dibromoethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dibromomethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichlorobenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,3-Dichlorobenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,4-Dichlorobenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dichlorodifluoromethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,1-Dichloroethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichloroethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,1-Dichloroethene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
cis-1,2-Dichloroethene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
trans1,2-Dichloroethene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichloropropane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,3-Dichloropropane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM

OP 2-2-94

Compiled: SMF 11/29/94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B ST
ANCHORAGE, AK 995
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-14
Client Sample ID :LAY-SS06-2S12
Matrix :SOIL

Qualifier/Comments

2,2-Dichloropropane	2.00	U	mg/Kg	EPA 8260	(J)-A.1	09/10	10/01	KWM
1,1-Dichloropropene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Ethylbenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Hexachlorobutadiene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Isopropylbenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
p-Isopropyltoluene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Methylene Chloride	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Napthalene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
n-Propylbenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Styrene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1112-Tetrachloroethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1122-Tetrachloroethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Tetrachloroethene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Toluene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2,3-Trichlorobenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2,4-Trichlorobenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,1,1-Trichloroethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,1,2-Trichloroethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Trichloroethene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Trichlorofluoromethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2,3-Trichloropropane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2,4-Trimethylbenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,3,5-Trimethylbenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Vinyl Chloride	2.00	U	mg/Kg	EPA 8260		09/10	10/01	WM
p+m-Xylene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	WM
o-Xylene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Semivolatile Organics				EPA 8270				
Phenol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
bis(2-Chloroethyl)ether	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2-Chlorophenol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
1,3-Dichlorobenzene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
1,4-Dichlorobenzene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Benzyl Alcohol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
1,2-Dichlorobenzene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2-Methylphenol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
bis(2-Chloroisopropyl)e	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
4-Methylphenol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
n-Nitroso-di-n-Propylam	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Hexachloroethane	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Nitrobenzene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Isophorone	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2-Nitrophenol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2,4-Dimethylphenol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Benzoic Acid	2.25	U	mg/Kg	EPA 8270	(J)-D.1	09/17	10/26	GV
bis(2-Chloroethoxy)Meth	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2,4-Dichlorophenol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
1,2,4-Trichlorobenzene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Naphthalene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
4-Chloroaniline	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Hexachlorobutadiene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV

CP 2-2-94

Originally: 2-1-94

Compiled 11/29/94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Analytical Comments

Chemlab Ref.# :93.4693-14
Client Sample ID :LAY-SS06-2S12
Matrix :SOIL

4-Chloro-3-Methylphenol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2-Methylnaphthalene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Hexachlorocyclopentadie	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2,4,6-Trichlorophenol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2,4,5-Trichlorophenol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2-Chloronaphthalene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2-Nitroaniline	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Dimethylphthalate	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Acenaphthylene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2,6-Dinitrotoluene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
3-Nitroaniline	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Acenaphthene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2,4-Dinitrophenol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
4-Nitrophenol	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Dibenzofuran	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
2,4-Dinitrotoluene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Diethylphthalate	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
4-Chlorophenyl-Phenylet	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Fluorene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
4-Nitroaniline	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
4,6-Dinitro-2-Methylphe	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
n-Nitrosodiphenylamine	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
4-Bromophenyl-Phenyleth	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Hexachlorobenzene	2.25	U	mg/Kg	EPA 8270	(J)-D.1	09/17	10/26	GV
Pentachlorophenol	2.25	U	mg/Kg	EPA 8270	(J)-D.1	09/17	10/26	GV
Phenanthrene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Anthracene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
di-n-Butylphthalate	2.79	~~B~~	mg/Kg	EPA 8270	(U)-E.1, F.2	09/17	10/26	GV
Fluoranthene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Pyrene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Butylbenzylphthalate	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
3,3-Dichlorobenzidine	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Benzo(a)Anthracene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Chrysene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
bis(2-Ethylhexyl)Phthal	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
di-n-Octylphthalate	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Benzo(b)Fluoranthene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Benzo(k)Fluoranthene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Benzo(a)Pyrene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Indeno(1,2,3-cd)Pyrene	2.25	U	mg/Kg	EPA 8270		09/17	10/26	GV
Dibenz(a,h)Anthracene	2.25	U	mg/Kg	EPA 8270	(J)-D.1	09/17	10/26	GV
Benzo(g,h,i)Perylene	2.25	U	mg/Kg	EPA 8270	(J)-D.1	09/17	10/26	GV

CB
2-1-94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-15
Client Sample ID :LAY-SS06-2S13
Matrix :SOIL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 15:13 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	82.2		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	18.5		mg/Kg	3510/3550/8100M		09/14	09/21	JBH
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	1.41		mg/Kg	EPA 5030/8015m		09/10	09/17	WLS
Benzene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS
Toluene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	
Ethylbenzene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	
p&m Xylene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS
o-Xylene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-16
Client Sample ID :LAY-SS06-2S14
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 15:30 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. 55.8 MG/KG OF EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	95.8		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	220		mg/Kg	3510/3550/8100M		09/14	09/21	JBH
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	1.28		mg/Kg	EPA 5030/8015m		09/10	09/17	WLS
Benzene	0.020	U	mg/Kg	EPA 8020		09/10	09/17	WLS
Toluene	0.020	U	mg/Kg	EPA 8020		09/10	09/17	WLS
Ethylbenzene	0.020	U	mg/Kg	EPA 8020		09/10	09/17	WLS
p&m Xylene	0.031		mg/Kg	EPA 8020		09/10	09/17	WLS
o-Xylene	0.020	U	mg/Kg	EPA 8020		09/10	09/17	WLS

* See Special Instructions Above
See Sample Remarks Above
= Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-17
Client Sample ID :LAY-SS06-2S15
Matrix :SOIL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 15:40 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : C. Armstead

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	98.4		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	14.4		mg/Kg	3510/3550/8100M		09/14	09/21	JBH
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.607		mg/Kg	EPA 5030/8015m		09/10	09/17	WLS
Benzene	0.020	U	mg/Kg	EPA 8020		09/10	09/17	WLS
Toluene	0.020	U	mg/Kg	EPA 8020		09/10	09/17	[illegible]S
Ethylbenzene	0.020	U	mg/Kg	EPA 8020		09/10	09/17	[illegible]S
p&m Xylene	0.020	U	mg/Kg	EPA 8020		09/10	09/17	WLS
o-Xylene	0.020	U	mg/Kg	EPA 8020		09/10	09/17	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-18
Client Sample ID :LAY-SS06-2S16
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 15:50 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. 4630 MG/KG OF EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	50.4		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	9030	D	mg/Kg	3510/3550/8100M		09/14	09/21	JBH
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	733	D	mg/Kg	EPA 5030/8015m		09/10	09/18	WLS

Benzene	0.178	D	mg/Kg	EPA 8020		09/10	09/18	WLS
Toluene	1.56	D	mg/Kg	EPA 8020		09/10	09/18	WLS
Ethylbenzene	2.15	D	mg/Kg	EPA 8020		09/10	09/18	WLS
p&m Xylene	3.29	D	mg/Kg	EPA 8020		09/10	09/18	WLS
o-Xylene	1.45	D	mg/Kg	EPA 8020		09/10	09/18	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-19
Client Sample ID :LAY-SS06-2S18
Matrix :SOIL

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70764
Ordered By	:SHERI K ACE	Report Completed	:11/09/93
Project Name	:DEWLINE RI/FS	Collected	:09/07/93 @ 15:55 hrs
Project#	:41096-412-01	Received	:09/09/93 @ 12:00 hrs
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	:

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. 6530 MG/KG OF EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	66.2		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	15200	D	mg/Kg	3510/3550/8100M		09/14	09/21	JBH
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	937	D	mg/Kg	EPA 5030/8015m		09/10	09/18	WLS
Benzene	0.156		mg/Kg	EPA 8020		09/10	09/21	WLS
Toluene	0.856		mg/Kg	EPA 8020		09/10	09/21	WLS
Ethylbenzene	2.57		mg/Kg	EPA 8020		09/10	09/21	WLS
p&m Xylene	2.58		mg/Kg	EPA 8020		09/10	09/21	WLS
o-Xylene	1.16		mg/Kg	EPA 8020		09/10	09/21	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected. Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-11
Client Sample ID :LAY-SS06-2SD05
Matrix :SOIL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 15:15 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	11.7		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	10300	D	mg/Kg	3510/3550/8100M		09/14	09/21	JBH
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	16.3		mg/Kg	EPA 5030/8015m		09/10	09/18	WLS
Benzene	---							
Toluene	0.500	U	mg/Kg	EPA 8020		09/10	09/18	WLS
Ethylbenzene	0.500	U	mg/Kg	EPA 8020		09/10	09/18	WLS
p&m Xylene	0.500	U	mg/Kg	EPA 8020		09/10	09/18	WLS
o-Xylene	0.500	U	mg/Kg	EPA 8020		09/10	09/18	WLS
	0.500	U	mg/Kg	EPA 8020		09/10	09/18	WLS

* See Special Instructions Above
See Sample Remarks Above
= Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-12
Client Sample ID :LAY-SS06-2SD06
Matrix :SOIL

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70764
Ordered By	:SHERI K ACE	Report Completed	:11/09/93
Project Name	:DEWLINE RI/FS	Collected	:09/07/93 @ 15:25 hrs
Project#	:41096-412-01	Received	:09/09/93 @ 12:00 hrs
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	:

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	87.9		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	4.61		mg/Kg	3510/3550/8100M		09/14	09/21	JBH
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.500	U	mg/Kg	EPA 5030/8015m		09/10	09/18	WLS

Benzene	0.025	U	mg/Kg	EPA 8020		09/10	09/18	WLS
Toluene	0.025	U	mg/Kg	EPA 8020		09/10	09/18	
Ethylbenzene	0.025	U	mg/Kg	EPA 8020		09/10	09/18	
p&m Xylene	0.025	U	mg/Kg	EPA 8020		09/10	09/18	WLS
o-Xylene	0.025	U	mg/Kg	EPA 8020		09/10	09/18	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected. Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-13
Client Sample ID :LAY-SS06-2SD07
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 15:35 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Qualifier/Comments

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	87.3		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	5.19		mg/Kg	3510/3550/8100M (J) - K.1		09/14	09/21	JBH
Hydrocarbons VPH	3.64		mg/Kg	EPA 5030/8015M		09/10	09/18	WLS
Volatile Organics				EPA 8260				
Benzene	0.020		mg/Kg	EPA 8260 (J) - A.1		09/10	10/01	KWM
Bromobenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromochloromethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromodichloromethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromoform	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromomethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
n-Butylbenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
sec-Butylbenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
tert-Butylbenzne	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Carbon Tetrachloride	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chlorobenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloroethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloroform	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloromethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
2-Chlorotoluene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
4-Chlorotoluene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dibromochloromethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
12Dibromo3Chloropropane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dibromoethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dibromomethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,3-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,4-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dichlorodifluoromethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,1-Dichloroethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichloroethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,1-Dichloroethene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
cis-1,2-Dichloroethene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
trans1,2-Dichloroethene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichloropropane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,3-Dichloropropane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM

2-2-94

Compiled: [illegible] 1/29/94

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STR
ANCHORAGE, AK 9
TEL: (907) 562-23
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-13
Client Sample ID :LAY-SS06-2SD07
Matrix :SOIL

Qualifier / Comments

2,2-Dichloropropane	0.020	U	mg/Kg	EPA 8260 (J)-A.1	09/10	10/01	KWM
1,1-Dichloropropene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Ethylbenzene	0.085		mg/Kg	EPA 8260	09/10	10/01	KWM
Hexachlorobutadiene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Isopropylbenzene	0.022		mg/Kg	EPA 8260	09/10	10/01	KWM
p-Isopropyltoluene	0.021		mg/Kg	EPA 8260	09/10	10/01	KWM
Methylene Chloride	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Napthalene	0.092		mg/Kg	EPA 8260	09/10	10/01	KWM
n-Propylbenzene	0.068		mg/Kg	EPA 8260	09/10	10/01	KWM
Styrene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1112-Tetrachloroethane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1122-Tetrachloroethane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Tetrachloroethene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Toluene	0.199		mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,3-Trichlorobenzene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,4-Trichlorobenzene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,1,1-Trichloroethane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,1,2-Trichloroethane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Trichloroethene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Trichlorofluoromethane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,3-Trichloropropane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,4-Trimethylbenzene	0.287		mg/Kg	EPA 8260	09/10	10/01	KWM
1,3,5-Trimethylbenzene	0.203		mg/Kg	EPA 8260	09/10	10/01	KWM
Vinyl Chloride	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
p+m-Xylene	0.341		mg/Kg	EPA 8260	09/10	10/01	KWM
o-Xylene	0.110		mg/Kg	EPA 8260	09/10	10/01	KWM
Semivolatile Organics				EPA 8270			
Phenol	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
bis(2-Chloroethyl)ether	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
2-Chlorophenol	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
1,3-Dichlorobenzene	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
1,4-Dichlorobenzene	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
Benzyl Alcohol	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
1,2-Dichlorobenzene	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
2-Methylphenol	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
bis(2-Chloroisopropyl)e	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
4-Methylphenol	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
n-Nitroso-di-n-Propylam	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
Hexachloroethane	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
Nitrobenzene	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
Isophorone	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
2-Nitrophenol	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
2,4-Dimethylphenol	0.228	U	mg/Kg	EPA 8270 (J) - D.1	09/17	10/26	GV
Benzoic Acid	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
bis(2-Chloroethoxy)Meth	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
2,4-Dichlorophenol	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
1,2,4-Trichlorobenzene	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
Naphthalene	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
4-Chloroaniline	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV
Hexachlorobutadiene	0.228	U	mg/Kg	EPA 8270	09/17	10/26	GV

Original by: CJ 2-1-94

OP 2-2-94

Compiled: SMF 1/29/94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-13
Client Sample ID :LAY-SS06-2SD07
Matrix :SOIL

Qualifier/Comments

4-Chloro-3-Methylphenol	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
2-Methylnaphthalene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Hexachlorocyclopentadie	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
2,4,6-Trichlorophenol	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
2,4,5-Trichlorophenol	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
2-Chloronaphthalene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
2-Nitroaniline	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Dimethylphthalate	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Acenaphthylene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
2,6-Dinitrotoluene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
3-Nitroaniline	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Acenaphthene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
2,4-Dinitrophenol	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
4-Nitrophenol	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Dibenzofuran	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
2,4-Dinitrotoluene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Diethylphthalate	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
4-Chlorophenyl-Phenylet	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Fluorene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
4-Nitroaniline	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
4,6-Dinitro-2-Methylphe	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
n-Nitrosodiphenylamine	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
4-Bromophenyl-Phenyleth	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Hexachlorobenzene	0.228	U	mg/Kg	EPA 8270	(J)-D.1	09/17	10/26	GV
Pentachlorophenol	0.228	U	mg/Kg	EPA 8270	(J)-D.1	09/17	10/26	GV
Phenanthrene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Anthracene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
di-n-Butylphthalate	2.88	~~B~~	mg/Kg	EPA 8270	(U)-E.1, F.2	09/17	10/26	GV
Fluoranthene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Pyrene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Butylbenzylphthalate	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
3,3-Dichlorobenzidine	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Benzo(a)Anthracene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Chrysene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
bis(2-Ethylhexyl)Phthal	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
di-n-Octylphthalate	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Benzo(b)Fluoranthene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Benzo(k)Fluoranthene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Benzo(a)Pyrene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Indeno(1,2,3-cd)Pyrene	0.228	U	mg/Kg	EPA 8270		09/17	10/26	GV
Dibenz(a,h)Anthracene	0.228	U	mg/Kg	EPA 8270	(J)-D.1	09/17	10/26	GV
Benzo(g,h,i)Perylene	0.228	U	mg/Kg	EPA 8270	(J)-D.1	09/17	10/26	GV

2-1-94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4356-12
Client Sample ID :LAY-SS06-SW02 POINT LAY
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70116
Report Completed :10/06/93
Collected :08/24/93 @ 15:25 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-12
Client Sample ID :LAY-SS06-SW02 POINT LAY
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Methylene Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Napthalene	0.0021		mg/L	EPA 8260	09/02	09/02	MCM
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Styrene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Toluene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Trichloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,3,5-Trimethylbenzene	0.0012		mg/L	EPA 8260	09/02	09/02	MCM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM

===

* See Special Instructions Above
See Sample Remarks Above
Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-10
Client Sample ID :LAY-SS06-SW02 POINT LAY
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70106
Report Completed :10/07/93
Collected :08/24/93 @ hrs
Received :08/26/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : Steph C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics				EPA 8270				
Phenol	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Chloroethyl)ether	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Chlorophenol	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
1,3-Dichlorobenzene	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
1,4-Dichlorobenzene	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzyl Alcohol	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
1,2-Dichlorobenzene	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Methylphenol	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Chloroisopropyl)e	0.010	U	mg/L	EPA 8270		08/30	09/06	[illegible]
4-Methylphenol	0.010	U	mg/L	EPA 8270		08/30	09/06	[illegible]
n-Nitroso-di-n-Propylam	0.010	U	mg/L	EPA 8270		08/30	09/06	[illegible]
Hexachloroethane	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
Nitrobenzene	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
Isophorone	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Nitrophenol	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dimethylphenol	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzoic Acid	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Chloroethoxy)Meth	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dichlorophenol	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
1,2,4-Trichlorobenzene	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
Naphthalene	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Chloroaniline	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
Hexachlorobutadiene	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Chloro-3-Methylphenol	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Methylnaphthalene	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
Hexachlorocyclopentadie	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4,6-Trichlorophenol	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4,5-Trichlorophenol	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Chloronaphthalene	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Nitroaniline	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
Dimethylphthalate	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
Acenaphthylene	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
2,6-Dinitrotoluene	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
3-Nitroaniline	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
Acenaphthene	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dinitrophenol	0.010	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Nitrophenol	0.010	U	mg/L	EPA 8270		08/30	09/06	[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-10
Client Sample ID :LAY-SS06-SW02 POINT LAY
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Dibenzofuran	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
2,4-Dinitrotoluene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Diethylphthalate	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
4-Chlorophenyl-Phenylet	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Fluorene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
4-Nitroaniline	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
4,6-Dinitro-2-Methylphe	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
n-Nitrosodiphenylamine	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
4-Bromophenyl-Phenyleth	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Hexachlorobenzene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Pentachlorophenol	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Phenanthrene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Anthracene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
di-n-Butylphthalate	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Fluoranthene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Pyrene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Butylbenzylphthalate	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
3,3-Dichlorobenzidine	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Benzo(a)Anthracene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Chrysene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
bis(2-Ethylhexyl)Phthal	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
di-n-Octylphthalate	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Benzo(b)Fluoranthene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Benzo(k)Fluoranthene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Benzo(a)Pyrene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Indeno(1,2,3-cd)Pyrene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Dibenz(a,h)Anthracene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT
Benzo(g,h,i)Perylene	0.010	U	mg/L	EPA 8270	08/30	09/06	MTT

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B ST
ANCHORAGE, AK 9
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-5
Client Sample ID :LAY-SS06-SW02 POINT LAY
Matrix :WATER

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70131
Ordered By	:RAY MORRIS	Report Completed	:09/20/93
Project Name	:DEW LINE RI/FS	Collected	:08/24/93 @ 15:25 hrs
Project#	:41096-412-01	Received	:08/26/93 @ 12:00 hrs
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	:

Sample Remarks: SAMPLE COLLECTED BY: J.P.

Parameter	Results	QC Qual	Qual (2)	Units	Comment	Method	Allowable Limits	Ext. Date	Anal Date	Init
Total Metals Analysis	---					-				
ICP Screen, ICF						EPA	n/a			
Aluminum	0.10	U		mg/L		EPA 6010		09/02	09/06	DLG
Antimony	0.10	U		mg/L		EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U		mg/L		EPA 6010		09/02	09/06	DLG
Barium	0.36			mg/L		EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U		mg/L		EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U		mg/L		EPA 6010		09/02	09/06	DLG
Calcium	52			mg/L		EPA 6010		09/02	09/06	DLG
Chromium	0.050	U		mg/L		EPA 6010		09/02	09/06	DLG
Cobalt	0.10	U		mg/L		EPA 6010		09/02	09/06	G
Copper	0.050	U		mg/L		EPA 6010		09/02	09/06	G
Iron	5.6			mg/L		EPA 6010		09/02	09/06	DLG
Lead	0.10	U		mg/L		EPA 6010		09/02	09/06	DLG
Magnesium	26			mg/L		EPA 6010		09/02	09/06	DLG
Manganese	1.7			mg/L		EPA 6010		09/02	09/06	DLG
Molybdenum	0.050	U		mg/L		EPA 6010		09/02	09/06	DLG
Nickel	0.050	U		mg/L		EPA 6010		09/02	09/06	DLG
Potassium	5.0	U		mg/L		EPA 6010		09/02	09/06	DLG
Selenium	0.10	U		mg/L		EPA 6010		09/02	09/06	DLG
Silver	0.050	U	J	mg/L	J.1	EPA 6010		09/02	09/06	DLG
Sodium	45			mg/L		EPA 6010		09/15	09/17	DFL
Thallium	0.005	U		mg/L		EPA 7841		09/03	09/06	BMW
Vanadium	0.050	U		mg/L		EPA 6010		09/02	09/06	DLG
Zinc	0.061	U		mg/L		EPA 6010		09/15	09/17	DFL
Dissolved Metals Analys	---					-				
ICP Screen, ICF						EPA	n/a			
Aluminum	0.10	U		mg/L		EPA 6010		09/02	09/06	DLG
Antimony	0.10	U		mg/L		EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U		mg/L		EPA 6010		09/02	09/06	DLG
Barium	0.34			mg/L		EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U		mg/L		EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U		mg/L		EPA 6010		09/02	09/06	DLG
Calcium	51			mg/L		EPA 6010		09/02	09/06	DLG
Chromium	0.050	U		mg/L		EPA 6010		09/02	09/06	DLG
Cobalt	0.10	U		mg/L		EPA 6010		09/02	09/06	DLG
Copper	0.050	U		mg/L		EPA 6010		09/02	09/06	DLG

All changes D.L. 2/2/94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4358-5
Client Sample ID :LAY-SS06-SW02 POINT LAY
Matrix :WATER

		Qualifier		Comment				
Iron	0.88		mg/L		EPA 6010	09/02	09/06	DLG
Lead	0.10	U	mg/L		EPA 6010	09/02	09/06	DLG
Magnesium	26		mg/L		EPA 6010	09/02	09/06	DLG
Manganese	1.7		mg/L		EPA 6010	09/02	09/06	DLG
Molybdenum	0.050	U	mg/L		EPA 6010	09/02	09/06	DLG
Nickel	0.050	U	mg/L		EPA 6010	09/02	09/06	DLG
Potassium	5.0	U	mg/L		EPA 6010	09/02	09/06	DLG
Selenium	0.10	U	mg/L		EPA 6010	09/02	09/06	DLG
Silver	0.050	U J	mg/L	J, 1	EPA 6010	09/02	09/06	DLG
Sodium	44		mg/L		EPA 6010	09/15	09/17	DFL
Thallium	0.005	U	mg/L		EPA 7841	09/03	09/08	BMW
Vanadium	0.050	U	mg/L		EPA 6010	09/02	09/06	DLG
Zinc	0.050	U	mg/L		EPA 6010	09/15	09/17	DFL

All chags a.c. 2/2/94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

ICF ID	LAY-SS06-S01
F&BI Number	636
Sample Type	soil
Date Received	8/25/93
% Dry Weight	87
Sequence Date	#5-08/25/93
Leaded Gas	
JP-4	<100
Lube Oil	40000
Diesel	~~25000~~ 23000 J
Spike Level	
Unknown Semi-volatile	
Pentacosane	interferences prevented measurement
Sequence Date	#5-08/25/93
PCB 1221	~~<0.1~~ <0.5
PCB 1232	~~<0.1~~ <0.5
PCB 1016	~~<0.1~~ <0.5
PCB 1242	~~<0.1~~ <0.5
PCB 1248	~~<0.1~~ <0.5
PCB 1254	~~<0.1~~ <0.5
PCB 1260	~~<0.1~~ <0.5
Spike Level	
Dibutyl Chlorendate	290 outside control limits
Sequence Date	
alpha-BHC	
beta-BHC	
gamma-BHC	
delta-BHC	
Heptachlor	
Aldrin	
Heptachlor Epoxide	
Endosulfan I	
DDE	
Dieldrin	
Endrin	
Endosulfan II	
DDD	
Endrin Aldehyde	
DDT	
Endosulfan Sulfate	
Endrin Ketone	
Methoxy Chlor	
Chlordane	
Dibutyl Chlorendate	
Spike Level	
Vol Sequence	#1&2-08/25/93
CCl4	<0.02 J
TCA	1.8 J
Benzene	<0.02
TCE	1 J
Toluene	<0.02
PCE	1.3 J
Ethylbenzene	<0.02
Xylenes	<0.04
Gasoline	~~34~~ 25 J
Spike level	
BFB	115

RJB
6-14-95

ICF ID	LAY-SS06-S02	LAY-SS06-S03
F&BI Number	638	640
Sample Type	soil	soil
Date Received	8/25/93	8/25/93
% Dry Weight	77	78
Sequence Date	#5-08/25/93	#5-08/25/93
Leaded Gas		
JP-4	<60	<80
Lube Oil	2300	<180
Diesel	~~35000~~ 33400 J	~~<80~~ <60
Spike Level		
Unknown Semi-volatile		
Pentacosane	interferences prevented measurement	131
Sequence Date	#5-08/25/93	#5-08/25/93
PCB 1221	~~<0.1~~ <0.5	<0.1
PCB 1232	~~<0.1~~ <0.5	<0.1
PCB 1016	~~<0.1~~ <0.5	<0.1
PCB 1242	~~<0.1~~ <0.5	<0.1
PCB 1248	~~<0.1~~ <0.5	<0.1
PCB 1254	~~<0.1~~ <0.5	<0.1
PCB 1260	~~<0.1~~ <0.5	<0.1
Spike Level	119%	
Dibutyl Chlorendate	~~180 outside control limits~~	131
Sequence Date		#5-08/25/93
alpha-BHC		<0.02 J
beta-BHC		<0.02 J
gamma-BHC		<0.02 J
delta-BHC		<0.02 J
Heptachlor		<0.02 J
Aldrin		<0.02 J
Heptachlor Epoxide		<0.02 J
Endosulfan I		<0.02 J
DDE		<0.02 J
Dieldrin		<0.02 J
Endrin		<0.02 J
Endosulfan II		<0.02 J
DDD		<0.02 J
Endrin Aldehyde		<0.02 J
DDT		<0.02 J
Endosulfan Sulfate		<0.02 J
Endrin Ketone		<0.02 J
Methoxy Chlor		~~<0.1~~ <0.5 J
Chlordane		<0.5 J
Dibutyl Chlorendate		131
Spike Level		
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93
CCl4	<0.03 J	<0.03 J
TCA	1 J	<0.03 J
Benzene	<0.03	<0.03
TCE	2 J	<0.03 J
Toluene	~~1.2~~ 3	<0.03
PCE	43 J	~~2~~ 1 J
Ethylbenzene	6.8	<0.03
Xylenes	21 J	<0.06
Gasoline	~~780~~ 540 J	~~<2~~ <37 J
Spike level		
BFB	116	118

RJB
6-14-95

ICF ID	LAY-SS06-S04	LAY-SS06-S05
F&BI Number	642	644
Sample Type	soil	soil
Date Received	8/25/93	8/25/93
% Dry Weight	75	68
Sequence Date	#5-08/25/93	#5-08/25/93
Leaded Gas		
JP-4	<150	<160
Lube Oil	1900	<160
Diesel	~~20000 diesel and motor oil~~ 12800 J	80 J
Spike Level		
Unknown Semi-volatile		
Pentacosane	133	115
Sequence Date	#5-08/25/93	#5-08/25/93
PCB 1221	<0.1	<0.1
PCB 1232	<0.1	<0.1
PCB 1016	<0.1	<0.1
PCB 1242	<0.1	<0.1
PCB 1248	<0.1	<0.1
PCB 1254	<0.1	<0.1
PCB 1260	<0.1	<0.1
Spike Level		
Dibutyl Chlorendate	133	115
Sequence Date		
alpha-BHC		
beta-BHC		
gamma-BHC		
delta-BHC		
Heptachlor		
Aldrin		
Heptachlor Epoxide		
Endosulfan I		
DDE		
Dieldrin		
Endrin		
Endosulfan II		
DDD		
Endrin Aldehyde		
DDT		
Endosulfan Sulfate		
Endrin Ketone		
Methoxy Chlor		
Chlordane		
Dibutyl Chlorendate		
Spike Level		
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93
CCl4	<0.03 J	<0.03 J
TCA	0.5 J	<0.03 J
Benzene	<0.03	~~<0.03~~ <0.05 J
TCE	<0.03 J	<0.03 J
Toluene	~~2~~ 4	~~<0.03~~ <0.5
PCE	<0.03 J	<0.03 J
Ethylbenzene	~~7~~ 14	~~<0.03 J~~ <2.0 J
Xylenes	~~19~~ 42 J	~~<0.06 J~~ <1.0 J
Gasoline	~~570~~ 397 J	~~<2~~ <34 J
Spike level		
BFB	124	118

RJB
6-14-95

ICF ID	LAY-SS06-S06	LAY-SS06-S07
F&BI Number	646	648
Sample Type	soil	soil
Date Received	8/25/93	8/25/93
% Dry Weight	49	74
Sequence Date	#5-08/25/93	#5-08/25/93
Leaded Gas		
JP-4	<80	<80
Lube Oil	<160	<160
Diesel	~~45000~~ 62000 J	~~<80~~ <70
Spike Level		
Unknown Semi-volatile		
Pentacosane	interferences prevented measurement	114
Sequence Date	#5-08/25/93	#5-08/25/93
PCB 1221	~~<0.1~~ <0.2	~~<0.5~~ <0.1
PCB 1232	~~<0.1~~ <0.2	~~<0.5~~ <0.1
PCB 1016	~~<0.1~~ <0.2	~~<0.5~~ <0.1
PCB 1242	~~<0.1~~ <0.2	~~<0.5~~ <0.1
PCB 1248	~~<0.1~~ <0.2	~~<0.5~~ <0.1
PCB 1254	~~<0.1~~ <0.2	~~<0.5~~ <0.1
PCB 1260	~~<0.1~~ <0.2	~~<0.5~~ <0.1
Spike Level		
Dibutyl Chlorendate	104 % ~~170 outside control limits~~	114
Sequence Date		
alpha-BHC		
beta-BHC		
gamma-BHC		
delta-BHC		
Heptachlor		
Aldrin		
Heptachlor Epoxide		
Endosulfan I		
DDE		
Dieldrin		
Endrin		
Endosulfan II		
DDD		
Endrin Aldehyde		
DDT		
Endosulfan Sulfate		
Endrin Ketone		
Methoxy Chlor		
Chlordane		
Dibutyl Chlorendate		
Spike Level		
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93
CCl4	<0.04 J	<0.03 J
TCA	<0.04 J	<0.03 J
Benzene	~~<0.04~~ <0.4 J	~~<0.03~~ <0.6 J
TCE	<0.04 J	<0.03 J
Toluene	~~<0.04~~ <0.4	~~<0.03~~ <0.6
PCE	<0.04 J	<0.03 J
Ethylbenzene	~~<0.04~~ <0.4 J	~~<0.03~~ <0.6 J
Xylenes	16 J	~~<0.06~~ <0.6 J
Gasoline	~~500~~ 316 J	~~<3~~ <40 J
Spike level		
BFB	121	117

RJB
6-14-95

ICF ID	LAY-SS06-S07	LAY-SS06-S07
F&BI Number	648 ms	648 msd
Sample Type	soil	soil
Date Received	8/25/93	8/25/93
% Dry Weight		
Sequence Date	#5-08/25/93	#5-08/25/93
Leaded Gas		
JP-4		
Lube Oil		
Diesel	77	100
Spike Level	500	500
Unknown Semi-volatile		
Pentacosane	128	170 outside control limits
Sequence Date	#5-08/25/93	#5-08/25/93
PCB 1221		
PCB 1232		
PCB 1016		
PCB 1242		
PCB 1248		
PCB 1254	110	120
PCB 1260		
Spike Level	5	5
Dibutyl Chlorendate	128	170 outside control limits
Sequence Date		
alpha-BHC		
beta-BHC		
gamma-BHC		
delta-BHC		
Heptachlor		
Aldrin		
Heptachlor Epoxide		
Endosulfan I		
DDE		
Dieldrin		
Endrin		
Endosulfan II		
DDD		
Endrin Aldehyde		
DDT		
Endosulfan Sulfate		
Endrin Ketone		
Methoxy Chlor		
Chlordane		
Dibutyl Chlorendate		
Spike Level		
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93
CCl4	79	97
TCA	103	87
Benzene	106	101
TCE	106	102
Toluene	95	98
PCE	81	76
Ethylbenzene	110	115
Xylenes	115	112
Gasoline		
Spike level	1	1
BFB	101	113

ICF ID	LAY-SS06-S08
F&BI Number	650
Sample Type	soil
Date Received	8/25/93
% Dry Weight	71
Sequence Date	#5-08/25/93
Leaded Gas	
JP-4	<100
Lube Oil	12000
Diesel	~~2500~~ 2600 J
Spike Level	
Unknown Semi-volatile	
Pentacosane	interferences prevented measurement
Sequence Date	#5-08/25-93
PCB 1221	~~<0.1~~ <0.2
PCB 1232	~~<0.1~~ <0.2
PCB 1016	~~<0.1~~ <0.2
PCB 1242	~~<0.1~~ <0.2
PCB 1248	~~<0.1~~ <0.2
PCB 1254	~~<0.1~~ <0.2
PCB 1260	~~<0.1~~ <0.2
Spike Level	
Dibutyl Chlorendate	160 outside control limits
Sequence Date	#5-08/25/93
alpha-BHC	<0.02 J
beta-BHC	<0.02 J
gamma-BHC	<0.02 J
delta-BHC	<0.02 J
Heptachlor	<0.02 J
Aldrin	<0.02 J
Heptachlor Epoxide	<0.02 J
Endosulfan I	<0.02 J
DDE	<0.02 J
Dieldrin	<0.02 J
Endrin	<0.02 J
Endosulfan II	<0.02 J
DDD	<0.02 J
Endrin Aldehyde	<0.02 J
DDT	<0.02 J
Endosulfan Sulfate	<0.02 J
Endrin Ketone	<0.02 J
Methoxy Chlor	~~<0.1~~ <0.5 J
Chlordane	<0.5 J
Dibutyl Chlorendate	160 outside recovery limits
Spike Level	
Vol Sequence	#1&2-08/25/93
CCl4	<0.03 J
TCA	<0.03 J
Benzene	<0.03
TCE	<0.03 J
Toluene	<0.03
PCE	<0.03 J
Ethylbenzene	<0.03
Xylenes	<0.06
Gasoline	~~5~~ <5 J
Spike level	
BFB	118

RSO
6-14-95

ICF ID	LAY-SS06-S09	LAY-SS06-S10
F&BI Number	652	654
Sample Type	soil	soil
Date Received	8/25/93	8/25/93
% Dry Weight	77	78
Sequence Date	#5-08/25/93	#5-08/25/93
Leaded Gas		
JP-4	<100	<50
Lube Oil	40000	<100
Diesel	18000 J	~~<50~~ <60
Spike Level		
Unknown Semi-volatile		
Pentacosane	interferences prevented measurement	
Sequence Date	#5-08/25-93	#5-08/25-93
PCB 1221	~~<0.1~~ <0.5	<0.1
PCB 1232	~~<0.1~~ <0.5	<0.1
PCB 1016	~~<0.1~~ <0.5	<0.1
PCB 1242	~~<0.1~~ <0.5	<0.1
PCB 1248	~~<0.1~~ <0.5	<0.1
PCB 1254	~~<0.1~~ <0.5	<0.1
PCB 1260	~~<0.1~~ <0.5	<0.1
Spike Level		
Dibutyl Chlorendate	220 outside control limits	~~222~~ 74%
Sequence Date		
alpha-BHC		
beta-BHC		
gamma-BHC		
delta-BHC		
Heptachlor		
Aldrin		
Heptachlor Epoxide		
Endosulfan I		
DDE		
Dieldrin		
Endrin		
Endosulfan II		
DDD		
Endrin Aldehyde		
DDT		
Endosulfan Sulfate		
Endrin Ketone		
Methoxy Chlor		
Chlordane		
Dibutyl Chlorendate		
Spike Level		
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93
CCl4	<0.03 J	<0.03 J
TCA	<0.03 J	<0.03 J
Benzene	<0.03	~~<0.03~~ <0.6 J
TCE	<0.03 J	<0.03 J
Toluene	0.2	~~<0.03~~ <0.6
PCE	0.1 J	<0.03 J
Ethylbenzene	3	<~~0.03~~ <0.6 J
Xylenes	8 J	<~~0.06~~ <0.6 J
Gasoline	~~71~~ 48 J	~~<3~~ <52 J
Spike level		
BFB	114	115

RJB
6-14-95

ICF ID	LAY-SS06-S11	LAY-SS06-SD01
F&BI Number	656	470
Sample Type	soil	soil
Date Received	8/25/93	8/24/93
% Dry Weight	82	88
Sequence Date	#5-08/25/93	#5-08/25/93
Leaded Gas		
JP-4	<50	<60
Lube Oil	<100	<120
Diesel	~~8300~~ 7600 J	~~7600~~ 10400 J
Spike Level		
Unknown Semi-volatile		
Pentacosane	~~interferences prevented measurement~~ 116 %	106
Sequence Date		#5-08/25/93
PCB 1221	<0.1	<0.1
PCB 1232	<0.1	<0.1
PCB 1016	<0.1	<0.1
PCB 1242	<0.1	<0.1
PCB 1248	<0.1	<0.1
PCB 1254	<0.1	<0.1
PCB 1260	<0.1	<0.1
Spike Level		
Dibutyl Chlorendate	~~160 outside control limits~~ 99 %	106
Sequence Date		
alpha-BHC		
beta-BHC		
gamma-BHC		
delta-BHC		
Heptachlor		
Aldrin		
Heptachlor Epoxide		
Endosulfan I		
DDE		
Dieldrin		
Endrin		
Endosulfan II		
DDD		
Endrin Aldehyde		
DDT		
Endosulfan Sulfate		
Endrin Ketone		
Methoxy Chlor		
Chlordane		
Dibutyl Chlorendate		
Spike Level		
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93
CCl4	<0.02 J	<0.03 J
TCA	0.7 J	<0.03 J
Benzene	<0.02	<0.03
TCE	<0.02 J	<0.03 J
Toluene	<0.02	<~~0.03~~ 0.16
PCE	<0.02 J	<0.03 J
Ethylbenzene	1.1	~~0.9~~ 2.5
Xylenes	3.9 J	~~10~~ 8.1 J
Gasoline	~~220~~ 150 J	~~450~~ 90 J
Spike level		
BFB	119	105

RJB
6-14-95

ICF ID	LAY-SS06-SD01	LAY-SS06-SD01	LAY-SS06-SD01	LAY-SS06-SD02
F&BI Number	470 dup	470 ms	470 msd	472
Sample Type	soil	soil	soil	soil
Date Received	8/24/93	8/24/93	8/24/93	8/24/93
% Dry Weight				84
Sequence Date	#5-08/25/93			#5-08/25/93
Leaded Gas				
JP-4	<60			<60
Lube Oil	<120			<120
Diesel	~~8600~~ 11800 J			<60
Spike Level				
Unknown Semi-volatile				
Pentacosane	115	137	134	96
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/25/93
PCB 1221	<0.1			<0.1
PCB 1232	<0.1			<0.1
PCB 1016	<0.1			<0.1
PCB 1242	<0.1			<0.1
PCB 1248	<0.1			<0.1
PCB 1254	<0.1	130	138	<0.1
PCB 1260	<0.1			<0.1
Spike Level		5	5	
Dibutyl Chlorendate	115	137	134	96
Sequence Date				
alpha-BHC				
beta-BHC				
gamma-BHC				
delta-BHC				
Heptachlor				
Aldrin				
Heptachlor Epoxide				
Endosulfan I				
DDE				
Dieldrin				
Endrin				
Endosulfan II				
DDD				
Endrin Aldehyde				
DDT				
Endosulfan Sulfate				
Endrin Ketone				
Methoxy Chlor				
Chlordane				
Dibutyl Chlorendate				
Spike Level				
Vol Sequence		#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93
CCl4				<0.03 J
TCA				<0.03 J
Benzene		87	87	<0.03
TCE		88	89	<0.03 J
Toluene		90	90	<0.03
PCE		94	94	<0.03 J
Ethylbenzene		128	112	<0.03
Xylenes				<0.06
Gasoline				~~<3~~ <1 J
Spike level		1	1	
BFB		116	113	104

RJB
6-14-95

ICF ID	LAY-SS06-SD03	LAY-SS06-SD04	LAY-SS06-SW01
F&BI Number	474	476	501
Sample Type	soil	soil	water
Date Received	8/24/93	8/24/93	8/25/93
% Dry Weight	90	34	
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/27/93
Leaded Gas			
JP-4	<60	<150	<1000
Lube Oil	<120	620	<2000
Diesel	<60	~~750~~ 1570 J	<1000
Spike Level			
Unknown Semi-volatile			
Pentacosane	88	102	128
Sequence Date	#5-08/25/93	#5-08/25/93	
PCB 1221	<0.1	~~<0.1~~ <0.3	
PCB 1232	<0.1	~~<0.1~~ <0.3	
PCB 1016	<0.1	~~<0.1~~ <0.3	
PCB 1242	<0.1	~~<0.1~~ <0.3	
PCB 1248	<0.1	~~<0.1~~ <0.3	
PCB 1254	<0.1	~~<0.1~~ <0.3	
PCB 1260	<0.1	~~<0.1~~ <0.3	
Spike Level			
Dibutyl Chlorendate	88	102	
Sequence Date			
alpha-BHC			
beta-BHC			
gamma-BHC			
delta-BHC			
Heptachlor			
Aldrin			
Heptachlor Epoxide			
Endosulfan I			
DDE			
Dieldrin			
Endrin			
Endosulfan II			
DDD			
Endrin Aldehyde			
DDT			
Endosulfan Sulfate			
Endrin Ketone			
Methoxy Chlor			
Chlordane			
Dibutyl Chlorendate			
Spike Level			
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93	
CCl4	<0.03 J	<0.05 J	
TCA	<0.03 J	<0.05 J	
Benzene	<0.03	0.3 J	
TCE	<0.03 J	<0.05 J	
Toluene	<0.03	0.9	
PCE	<0.03 J	<0.05 J	
Ethylbenzene	<0.03	1.5	
Xylenes	<0.06	6 J	
Gasoline	~~<3~~ <1 J	~~90~~ 59 J	
Spike level			
BFB	120	127	

RJB
6-14-95

ICF ID	LAY-SS06-SW01	LAY-SS06-SW02	LAY-SS06-SW02
F&BI Number	619	567	622
Sample Type	water	water	water
Date Received	8/25/93	8/25/93	8/25/93
% Dry Weight			
Sequence Date		#5-08/27/93	
Leaded Gas			
JP-4		<1000	
Lube Oil		<2000	
Diesel		<1000 J	
Spike Level			
Unknown Semi-volatile			
Pentacosane		104	
Sequence Date			
PCB 1221			
PCB 1232			
PCB 1016			
PCB 1242			
PCB 1248			
PCB 1254			
PCB 1260			
Spike Level			
Dibutyl Chlorendate			
Sequence Date			
alpha-BHC			
beta-BHC			
gamma-BHC			
delta-BHC			
Heptachlor			
Aldrin			
Heptachlor Epoxide			
Endosulfan I			
DDE			
Dieldrin			
Endrin			
Endosulfan II			
DDD			
Endrin Aldehyde			
DDT			
Endosulfan Sulfate			
Endrin Ketone			
Methoxy Chlor			
Chlordane			
Dibutyl Chlorendate			
Spike Level			
Vol Sequence	#3&4-08/25/93		#3&4-08/25/93
CCl4	<1		<1
TCA	<1		<1
Benzene	<1		<1
TCE	<1		<1
Toluene	<1		<1
PCE	<1		<1
Ethylbenzene	<1		<1
Xylenes	<2		<2
Gasoline	~~<50~~ <100 J		~~<50~~ <100 J
Spike level			
BFB	91		87

RJB
6-14-95

ICF ID	LAY-SS06-SW03	LAY-SS06-SW03	LAY-SS06-SW04
F&BI Number	500	626	499
Sample Type	water	water	water
Date Received	8/25/93	8/25/93	8/25/93
% Dry Weight			
Sequence Date	#5-08/27/93		#5-08/27/93
Leaded Gas			
JP-4	<1000		<1000
Lube Oil	<2000		<2000
Diesel	<1000		<1000
Spike Level			
Unknown Semi-volatile			
Pentacosane	105		89
Sequence Date			
PCB 1221			
PCB 1232			
PCB 1016			
PCB 1242			
PCB 1248			
PCB 1254			
PCB 1260			
Spike Level			
Dibutyl Chlorendate			
Sequence Date			
alpha-BHC			
beta-BHC			
gamma-BHC			
delta-BHC			
Heptachlor			
Aldrin			
Heptachlor Epoxide			
Endosulfan I			
DDE			
Dieldrin			
Endrin			
Endosulfan II			
DDD			
Endrin Aldehyde			
DDT			
Endosulfan Sulfate			
Endrin Ketone			
Methoxy Chlor			
Chlordane			
Dibutyl Chlorendate			
Spike Level			
Vol Sequence		#3&4-08/25/93	
CCl4		<1	
TCA		<1	
Benzene		<1	
TCE		<1	
Toluene		<1	
PCE		<1	
Ethylbenzene		<1	
Xylenes		<2	
Gasoline		~~≤50~~ <100 J	
Spike level			
BFB		98	

RJB
6-14-95

ICF ID	LAY-SS06-SW04
F&BI Number	616
Sample Type	water
Date Received	8/25/93
% Dry Weight	
Sequence Date	
Leaded Gas	
JP-4	
Lube Oil	
Diesel	
Spike Level	
Unknown Semi-volatile	
Pentacosane	
Sequence Date	
PCB 1221	
PCB 1232	
PCB 1016	
PCB 1242	
PCB 1248	
PCB 1254	
PCB 1260	
Spike Level	
Dibutyl Chlorendate	
Sequence Date	
alpha-BHC	
beta-BHC	
gamma-BHC	
delta-BHC	
Heptachlor	
Aldrin	
Heptachlor Epoxide	
Endosulfan I	
DDE	
Dieldrin	
Endrin	
Endosulfan II	
DDD	
Endrin Aldehyde	
DDT	
Endosulfan Sulfate	
Endrin Ketone	
Methoxy Chlor	
Chlordane	
Dibutyl Chlorendate	
Spike Level	
Vol Sequence	#3&4-08/25/93
CCl4	<1
TCA	<1
Benzene	<1
TCE	<1
Toluene	<1
PCE	<1
Ethylbenzene	<1
Xylenes	<2
Gasoline	~~<50~~ <100 J
Spike level	
BFB	89

RDB
6-14-90

ANALYTICAL DATA SHEETS FOR THE DRAINAGE PATHWAY
FROM POL TANKS (SS07)

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-9
Client Sample ID :LAY-~~AOC4~~-SD02 POINT LAY
Matrix :SOIL SS07

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70106
Report Completed :10/07/93
Collected :08/24/93 @ hrs
Received :08/26/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : Steph C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. SAME RESULTS FOR 8270 ARE NOT VALID DUE TO POOR OR NO SURROGATE RECOVERY.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics								
Benzene				EPA 8260				
Bromobenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromochloromethane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromodichloromethane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromoform	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Bromomethane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
n-Butylbenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
sec-Butylbenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
tert-Butylbenzne	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Carbon Tetrachloride	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloroethane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloroform	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Chloromethane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
2-Chlorotoluene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
4-Chlorotoluene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromochloromethane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
12Dibromo3Chloropropane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dibromoethane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromomethane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,4-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dichlorodifluoromethane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloroethane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
cis-1,2-Dichloroethene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
trans1,2-Dichloroethene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloropropane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichloropropane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
2,2-Dichloropropane	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloropropene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Ethylbenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Hexachlorobutadiene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM
Isopropylbenzene	0.025	U	mg/Kg	EPA 8260		08/26	09/13	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-9
Client Sample ID :LAY-~~AOC4~~-SD02 POINT LAY
Matrix :SOIL 5507

p-Isopropyltoluene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
Methylene Chloride	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
Napthalene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
n-Propylbenzene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
Styrene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
1112-Tetrachloroethane	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
1122-Tetrachloroethane	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
Tetrachloroethene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
Toluene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
1,2,3-Trichlorobenzene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
1,2,4-Trichlorobenzene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
1,1,1-Trichloroethane	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
1,1,2-Trichloroethane	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
Trichloroethene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
Trichlorofluoromethane	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
1,2,3-Trichloropropane	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
1,2,4-Trimethylbenzene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
1,3,5-Trimethylbenzene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KW
Vinyl Chloride	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KWM
p+m-Xylene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KWM
o-Xylene	0.025	U	mg/Kg	EPA 8260	08/26	09/13	KWM
Semivolatile Organics				EPA 8270			
Phenol	**		mg/Kg	EPA 8270			
bis(2-Chloroethyl)ether	**		mg/Kg	EPA 8270			
2-Chlorophenol	**		mg/Kg	EPA 8270			
1,3-Dichlorobenzene	**		mg/Kg	EPA 8270			
1,4-Dichlorobenzene	**		mg/Kg	EPA 8270			
Benzyl Alcohol	**		mg/Kg	EPA 8270			
1,2-Dichlorobenzene	**		mg/Kg	EPA 8270			
2-Methylphenol	**		mg/Kg	EPA 8270			
bis(2-Chloroisopropyl)e	**		mg/Kg	EPA 8270			
4-Methylphenol	**		mg/Kg	EPA 8270			
n-Nitroso-di-n-Propylam	**		mg/Kg	EPA 8270			
Hexachloroethane	**		mg/Kg	EPA 8270			
Nitrobenzene	**		mg/Kg	EPA 8270			
Isophorone	**		mg/Kg	EPA 8270			
2-Nitrophenol	**		mg/Kg	EPA 8270			
2,4-Dimethylphenol	**		mg/Kg	EPA 8270			
Benzoic Acid	**		mg/Kg	EPA 8270			
bis(2-Chloroethoxy)Meth	**		mg/Kg	EPA 8270			
2,4-Dichlorophenol	**		mg/Kg	EPA 8270			
1,2,4-Trichlorobenzene	**		mg/Kg	EPA 8270			
Naphthalene	**		mg/Kg	EPA 8270			
4-Chloroaniline	**		mg/Kg	EPA 8270			
Hexachlorobutadiene	**		mg/Kg	EPA 8270			
4-Chloro-3-Methylphenol	**		mg/Kg	EPA 8270			
2-Methylnaphthalene	**		mg/Kg	EPA 8270			
Hexachlorocyclopentadie	**		mg/Kg	EPA 8270			
2,4,6-Trichlorophenol	**		mg/Kg	EPA 8270			
2,4,5-Trichlorophenol	**		mg/Kg	EPA 8270			

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-9
Client Sample ID :LAY-~~AOC4~~-SD02 POINT LAY
Matrix :SOIL SS07

2-Chloronaphthalene	**	mg/Kg	EPA 8270
2-Nitroaniline	**	mg/Kg	EPA 8270
Dimethylphthalate	**	mg/Kg	EPA 8270
Acenaphthylene	**	mg/Kg	EPA 8270
2,6-Dinitrotoluene	**	mg/Kg	EPA 8270
3-Nitroaniline	**	mg/Kg	EPA 8270
Acenaphthene	**	mg/Kg	EPA 8270
2,4-Dinitrophenol	**	mg/Kg	EPA 8270
4-Nitrophenol	**	mg/Kg	EPA 8270
Dibenzofuran	**	mg/Kg	EPA 8270
2,4-Dinitrotoluene	**	mg/Kg	EPA 8270
Diethylphthalate	**	mg/Kg	EPA 8270
4-Chlorophenyl-Phenylet	**	mg/Kg	EPA 8270
Fluorene	**	mg/Kg	EPA 8270
4-Nitroaniline	**	mg/Kg	EPA 8270
4,6-Dinitro-2-Methylphe	**	mg/Kg	EPA 8270
n-Nitrosodiphenylamine	**	mg/Kg	EPA 8270
4-Bromophenyl-Phenyleth	**	mg/Kg	EPA 8270
Hexachlorobenzene	**	mg/Kg	EPA 8270
Pentachlorophenol	**	mg/Kg	EPA 8270
Phenanthrene	**	mg/Kg	EPA 8270
Anthracene	**	mg/Kg	EPA 8270
di-n-Butylphthalate	**	mg/Kg	EPA 8270
Fluoranthene	**	mg/Kg	EPA 8270
Pyrene	**	mg/Kg	EPA 8270
Butylbenzylphthalate	**	mg/Kg	EPA 8270
3,3-Dichlorobenzidine	**	mg/Kg	EPA 8270
Benzo(a)Anthracene	**	mg/Kg	EPA 8270
Chrysene	**	mg/Kg	EPA 8270
bis(2-Ethylhexyl)Phthal	**	mg/Kg	EPA 8270
di-n-Octylphthalate	**	mg/Kg	EPA 8270
Benzo(b)Fluoranthene	**	mg/Kg	EPA 8270
Benzo(k)Fluoranthene	**	mg/Kg	EPA 8270
Benzo(a)Pyrene	**	mg/Kg	EPA 8270
Indeno(1,2,3-cd)Pyrene	**	mg/Kg	EPA 8270
Dibenz(a,h)Anthracene	**	mg/Kg	EPA 8270
Benzo(g,h,i)Perylene	**	mg/Kg	EPA 8270

===

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-6
Client Sample ID :LAY-~~AOC4~~-2SD05
Matrix :SOIL SS07

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70792
Ordered By	:SHERI K ACE	Report Completed	:10/01/93
Project Name	:DEW LINE RI/FS	Collected	:09/07/93 @ 17:25 hrs
Project#	:41096-412-01	Received	:09/09/93 @ 12:00 hrs
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	: C. Vorstead

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. 10.3 MG/KG OF EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Qualifier/Comments

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init.
Percent Solids	72.8		%	SM17 2540G			09/10	EAL
Hydrocarbons VPH	0.600	U	mg/Kg	EPA 5030/8015M		09/10	09/15	WLS
Hydrocarbons EPH	27.7		mg/Kg	3510/3550/8100M (J)-K.1		09/14	09/17	JBH
Volatile Organics				EPA 8260				
Benzene	0.030	U	mg/Kg	EPA 8260 (J)-A.1		09/10	09/28	KWM
Bromobenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromochloromethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromodichloromethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromoform	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromomethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
n-Butylbenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
sec-Butylbenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
tert-Butylbenzne	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Carbon Tetrachloride	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chlorobenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroform	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloromethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
2-Chlorotoluene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
4-Chlorotoluene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromochloromethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
12Dibromo3Chloropropane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dibromoethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromomethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichlorobenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichlorobenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,4-Dichlorobenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dichlorodifluoromethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloroethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
cis-1,2-Dichloroethene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
trans1,2-Dichloroethene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloropropane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichloropropane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
2,2-Dichloropropane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM

CP 2-2-94

Compiled: SMF 1/29/94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-6
Client Sample ID :LAY-~~AOC4~~-2SD05
Matrix :SOIL SS07

Qualifier/Comments

1,1-Dichloropropene	0.030	U	mg/Kg	EPA 8260	(J)-A.1	09/10 09/28	KWM
Ethylbenzene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
Hexachlorobutadiene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
Isopropylbenzene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
p-Isopropyltoluene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
Methylene Chloride	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
Napthalene	0.030		mg/Kg	EPA 8260		09/10 09/28	KWM
n-Propylbenzene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
Styrene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
1112-Tetrachloroethane	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
1122-Tetrachloroethane	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
Tetrachloroethene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
Toluene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
1,2,3-Trichlorobenzene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
1,2,4-Trichlorobenzene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
1,1,1-Trichloroethane	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
1,1,2-Trichloroethane	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
Trichloroethene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
Trichlorofluoromethane	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
1,2,3-Trichloropropane	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
1,2,4-Trimethylbenzene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
1,3,5-Trimethylbenzene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
Vinyl Chloride	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM
p+m-Xylene	0.032		mg/Kg	EPA 8260		09/10 09/28	KWM
o-Xylene	0.030	U	mg/Kg	EPA 8260		09/10 09/28	KWM

2-2-94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT OF ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-7
Client Sample ID :LAY-~~A0C4~~-25D06
Matrix :SOIL 5507

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 17:35 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	85.7		%	SM17 2540G			09/10	EAL
Hydrocarbons VPH	0.500	U	mg/Kg	EPA 5030/8015M		09/10	09/15	WLS
Hydrocarbons EPH	21.7		mg/Kg	3510/3550/8100M		09/14	09/20	JBH
Volatile Organics				EPA 8260				
Benzene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromobenzene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromochloromethane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromodichloromethane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	[illegible]
Bromoform	0.025	U	mg/Kg	EPA 8260		09/10	09/28	[illegible]
Bromomethane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
n-Butylbenzene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
sec-Butylbenzene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
tert-Butylbenzne	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Carbon Tetrachloride	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chlorobenzene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroethane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroform	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloromethane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
2-Chlorotoluene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
4-Chlorotoluene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromochloromethane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
12Dibromo3Chloropropane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dibromoethane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromomethane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,4-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dichlorodifluoromethane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloroethane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
cis-1,2-Dichloroethene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
trans1,2-Dichloroethene	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloropropane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichloropropane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	KWM
2,2-Dichloropropane	0.025	U	mg/Kg	EPA 8260		09/10	09/28	[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1909

REPORT of ANALYSIS

hemlab Ref.# :93.4692-7
Client Sample ID :LAY-~~A0C4~~-2SD06
Matrix :SOIL SS07

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

1,1-Dichloropropene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Ethylbenzene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Hexachlorobutadiene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Isopropylbenzene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
p-Isopropyltoluene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Methylene Chloride	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Napthalene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
n-Propylbenzene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Styrene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1112-Tetrachloroethane	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1122-Tetrachloroethane	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Tetrachloroethene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Toluene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,3-Trichlorobenzene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trichlorobenzene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1,1-Trichloroethane	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1,2-Trichloroethane	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Trichloroethene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Trichlorofluoromethane	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,3-Trichloropropane	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trimethylbenzene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,3,5-Trimethylbenzene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Vinyl Chloride	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
p+m-Xylene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM
o-Xylene	0.025	U	mg/Kg	EPA 8260	09/10	09/28	KWM

* See Special Instructions Above
** See Sample Remarks Above
Undetected, Reported value is the practical quantification limit.
= Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT OF ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-8
Client Sample ID :LAY-~~A0C4~~ 2SD07
Matrix :SOIL SS07

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 16:00 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	72.5		%	SM17 2540G			09/10	EAL
Hydrocarbons VPH	0.600	U	mg/Kg	EPA 5030/8015M		09/10	09/15	WLS
Hydrocarbons EPH	10.8		mg/Kg	3510/3550/8100M		09/14	09/18	JBH
Volatile Organics				EPA 8260				
Benzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromobenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromochloromethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromodichloromethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromoform	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromomethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
n-Butylbenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
sec-Butylbenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
tert-Butylbenzne	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Carbon Tetrachloride	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chlorobenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroform	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloromethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
2-Chlorotoluene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
4-Chlorotoluene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromochloromethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
12Dibromo3Chloropropane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dibromoethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromomethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichlorobenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichlorobenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,4-Dichlorobenzene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dichlorodifluoromethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloroethane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,1-Dichloroethene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
cis-1,2-Dichloroethene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
trans1,2-Dichloroethene	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dichloropropane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichloropropane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM
2,2-Dichloropropane	0.030	U	mg/Kg	EPA 8260		09/10	09/28	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-8
Client Sample ID :LAY-~~A0C4~~ 2SD07
Matrix :SOIL SS07

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

1,1-Dichloropropene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Ethylbenzene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Hexachlorobutadiene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Isopropylbenzene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
p-Isopropyltoluene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Methylene Chloride	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Napthalene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
n-Propylbenzene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Styrene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1112-Tetrachloroethane	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1122-Tetrachloroethane	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Tetrachloroethene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Toluene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,3-Trichlorobenzene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trichlorobenzene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1,1-Trichloroethane	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,1,2-Trichloroethane	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Trichloroethene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Trichlorofluoromethane	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,3-Trichloropropane	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,2,4-Trimethylbenzene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
1,3,5-Trimethylbenzene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
Vinyl Chloride	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
p+m-Xylene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM
o-Xylene	0.030	U	mg/Kg	EPA 8260	09/10	09/28	KWM

===

* See Special Instructions Above
** See Sample Remarks Above
= Undetected, Reported value is the practical quantification limit.
= Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4356-7
Client Sample ID :LAY-~~A0C4~~-SW02
Matrix :WATER SS07

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70116
Ordered By	:RAY MORRIS	Report Completed	:10/06/93
Project Name	:DEW LINE RI/FS	Collected	:08/24/93 @ 12:52 hrs.
Project#	:41096-412-01	Received	:08/26/93 @ 12:00 hrs.
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
cis-1,2-Dichloroethene	0.0075		mg/L	EPA 8260		09/02	09/02	MCM
trans1,2-Dichloroethene	0.0021		mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-7
Client Sample ID :LAY-~~AOC4~~-SW02 SS07
Matrix :WATER

Methylene Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Napthalene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Styrene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Toluene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichlorobenzene	0.0013		mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Trichloroethene	0.0039		mg/L	EPA 8260	09/02	09/02	MCM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Semivolatile Organics				EPA 8270			
Phenol	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
[illegible](2-Chloroethyl)ether	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
[illegible]Chlorophenol	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
1,3-Dichlorobenzene	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
1,4-Dichlorobenzene	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
Benzyl Alcohol	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
1,2-Dichlorobenzene	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
2-Methylphenol	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
bis(2-Chloroisopropyl)e	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
4-Methylphenol	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
n-Nitroso-di-n-Propylam	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
Hexachloroethane	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
Nitrobenzene	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
Isophorone	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
2-Nitrophenol	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
2,4-Dimethylphenol	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
Benzoic Acid	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
bis(2-Chloroethoxy)Meth	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
2,4-Dichlorophenol	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
1,2,4-Trichlorobenzene	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
Naphthalene	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
4-Chloroaniline	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
Hexachlorobutadiene	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
4-Chloro-3-Methylphenol	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
2-Methylnaphthalene	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
Hexachlorocyclopentadie	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
2,4,6-Trichlorophenol	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
2,4,5-Trichlorophenol	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT
2-Chloronaphthalene	0.019	U	mg/L	EPA 8270	08/31	09/10	MTT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-7
Client Sample ID :LAY-~~AOC4~~-SW02
Matrix :WATER SS07

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

2-Nitroaniline	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Dimethylphthalate	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Acenaphthylene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
2,6-Dinitrotoluene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
3-Nitroaniline	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Acenaphthene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
2,4-Dinitrophenol	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
4-Nitrophenol	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Dibenzofuran	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
2,4-Dinitrotoluene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Diethylphthalate	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
4-Chlorophenyl-Phenylet	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Fluorene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
4-Nitroaniline	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
4,6-Dinitro-2-Methylphe	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
n-Nitrosodiphenylamine	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
4-Bromophenyl-Phenyleth	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Hexachlorobenzene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Pentachlorophenol	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Phenanthrene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Anthracene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
di-n-Butylphthalate	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Fluoranthene	0.019	U	mg/L	EPA 8270		08/31	09/10	MT
Pyrene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Butylbenzylphthalate	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
3,3-Dichlorobenzidine	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Benzo(a)Anthracene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Chrysene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
bis(2-Ethylhexyl)Phthal	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
di-n-Octylphthalate	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Benzo(b)Fluoranthene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Benzo(k)Fluoranthene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Benzo(a)Pyrene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Indeno(1,2,3-cd)Pyrene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Dibenz(a,h)Anthracene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
Benzo(g,h,i)Perylene	0.019	U	mg/L	EPA 8270		08/31	09/10	MTT
TOC, Nonpurgable				EPA 9060	n/a			
...TOC Range	14.7-16.0		mg/L	EPA 9060			09/07	CMR
...TOC Concentration	15.5		mg/L	EPA 9060			09/07	CMR
Residue, Non-Filterable	28		mg/L	EPA 160.2		08/30	08/31	GPP
Residue,Filterable(TDS)	1976		mg/L	EPA 160.1	500	09/01	09/02	RJK

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-1
Client Sample ID :LAY-~~AOC4~~-2SW04
Matrix :WATER SS07

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 16:00 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.**THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons VPH	0.189		mg/L	EPA 5030/8015M		09/13	09/13	WLS
Hydrocarbons EPH	0.961		mg/L	3510/3550/8100M		09/13	09/15	JBH
Volatile Organics				EPA 8260				
Benzene	0.0017		mg/L	EPA 8260				
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromoform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloromethane	0.0032	B	mg/L	EPA 8260		09/20	09/20	KWM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
12Dibromo3Chloropropane	**		mg/L	EPA 8260				
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethene	0.0023		mg/L	EPA 8260		09/20	09/20	KWM
cis-1,2-Dichloroethene	0.178	D	mg/L	EPA 8260		09/20	09/20	KWM
trans1,2-Dichloroethene	0.0036		mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-1
Client Sample ID :LAY-~~AOC4~~-2SW04
Matrix :WATER SS07

1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Ethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Hexachlorobutadiene	**		mg/L	EPA 8260			
Isopropylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Methylene Chloride	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Napthalene	**	U	mg/L	EPA 8260	09/20	09/20	KWM
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Styrene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Toluene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichlorobenzene	**		mg/L	EPA 8260			
1,2,4-Trichlorobenzene	**		mg/L	EPA 8260			
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Trichloroethene	0.068	D	mg/L	EPA 8260	09/20	09/20	KWM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-2
Client Sample ID :LAY-~~AOC4~~-2SW04 SPIKE
Matrix :WATER SS07
SML 12-6-95

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 16:00 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. FOR EPH AND 8260 VPH SPIKE AND SPIKE DUPLICATE RECOVERY AND RPD, SEE QC SUMMARY. **THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons VPH	0.714		mg/L	EPA 5030/8015M		09/13	09/13	WLS
Hydrocarbons EPH	15.8		mg/L	3510/3550/8100M		09/13	09/15	JBH
Volatile Organics				EPA 8260				
Benzene	0.092	D	mg/L	EPA 8260		09/20	09/20	KWM
Bromobenzene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromochloromethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromodichloromethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromoform	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromomethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
n-Butylbenzene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
sec-Butylbenzene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
tert-Butylbenzne	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Carbon Tetrachloride	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chlorobenzene	0.092	D	mg/L	EPA 8260		09/20	09/20	KWM
Chloroethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroform	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloromethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
2-Chlorotoluene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
4-Chlorotoluene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromochloromethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
12Dibromo3Chloropropane	**		mg/L	EPA 8260				
1,2-Dibromoethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromomethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichlorobenzene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichlorobenzene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,4-Dichlorobenzene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dichlorodifluoromethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloroethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethene	0.104	D	mg/L	EPA 8260		09/20	09/20	KWM
cis-1,2-Dichloroethene	0.168	D	mg/L	EPA 8260		09/20	09/20	KWM
trans1,2-Dichloroethene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloropropane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichloropropane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-2
Client Sample ID :LAY-~~A0C4~~-2SW04 SPIKE
Matrix :WATER SS07 8WL 12695

2,2-Dichloropropane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1-Dichloropropene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Ethylbenzene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Hexachlorobutadiene	**		mg/L	EPA 8260			
Isopropylbenzene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
p-Isopropyltoluene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Methylene Chloride	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Napthalene	**		mg/L	EPA 8260			
n-Propylbenzene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Styrene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1112-Tetrachloroethane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1122-Tetrachloroethane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Tetrachloroethene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Toluene	0.100	D	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichlorobenzene	**		mg/L	EPA 8260			
1,2,4-Trichlorobenzene	**		mg/L	EPA 8260			
1,1,1-Trichloroethane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1,2-Trichloroethane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Trichloroethene	0.149	D	mg/L	EPA 8260	09/20	09/20	KWM
Trichlorofluoromethane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichloropropane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,4-Trimethylbenzene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,3,5-Trimethylbenzene	0.010	U	mg/L	EPA 8260	09/20	09/20	[illegible]M
Vinyl Chloride	0.010	U	mg/L	EPA 8260	09/20	09/20	[illegible]M
p+m-Xylene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
o-Xylene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-3
Client Sample ID :LAY-~~AOC4~~-2SW04 SPIKE DUPLICATE SS07
Matrix :WATER
SMC 12.6.95

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 16:00 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. FOR EPH AND 8260 VPH SPIKE AND SPIKE DUPLICATE RECOVERY AND RPD, SEE QC SUMMARY. **THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons VPH	0.679		mg/L	EPA 5030/8015M		~~08~~ 9/13 SMC	~~08~~ 9/13 SMC	WLS
Hydrocarbons EPH	16.2		mg/L	3510/3550/8100M		09/13	09/13	JBH
Volatile Organics				EPA 8260				
Benzene	0.093	D	mg/L	EPA 8260		09/20	09/20	KWM
Bromobenzene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromochloromethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromodichloromethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromoform	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromomethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
n-Butylbenzene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
sec-Butylbenzene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
tert-Butylbenzne	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Carbon Tetrachloride	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chlorobenzene	0.096	D	mg/L	EPA 8260		09/20	09/20	KWM
Chloroethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroform	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloromethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
2-Chlorotoluene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
4-Chlorotoluene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromochloromethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
12Dibromo3Chloropropane	**		mg/L	EPA 8260				
1,2-Dibromoethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromomethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichlorobenzene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichlorobenzene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,4-Dichlorobenzene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dichlorodifluoromethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloroethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethene	0.112	D	mg/L	EPA 8260		09/20	09/20	KWM
cis-1,2-Dichloroethene	0.160	D	mg/L	EPA 8260		09/20	09/20	KWM
trans1,2-Dichloroethene	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloropropane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichloropropane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-3
Client Sample ID :LAY-~~AOC4~~-2SW04 SPIKE DUPLICATE SS07
Matrix :WATER
Swk 12.6.95

2,2-Dichloropropane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1-Dichloropropene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Ethylbenzene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Hexachlorobutadiene	**		mg/L	EPA 8260			
Isopropylbenzene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
p-Isopropyltoluene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Methylene Chloride	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Napthalene	**		mg/L	EPA 8260			
n-Propylbenzene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Styrene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1112-Tetrachloroethane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1122-Tetrachloroethane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Tetrachloroethene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Toluene	0.100	D	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichlorobenzene	**		mg/L	EPA 8260			
1,2,4-Trichlorobenzene	**		mg/L	EPA 8260			
1,1,1-Trichloroethane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1,2-Trichloroethane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
Trichloroethene	0.153	D	mg/L	EPA 8260	09/20	09/20	KWM
Trichlorofluoromethane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichloropropane	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,4-Trimethylbenzene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,3,5-Trimethylbenzene	0.010	U	mg/L	EPA 8260	09/20	09/20	[illegible]M
Vinyl Chloride	0.010	U	mg/L	EPA 8260	09/20	09/20	[illegible]M
p+m-Xylene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM
o-Xylene	0.010	U	mg/L	EPA 8260	09/20	09/20	KWM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-4
Client Sample ID :LAY-~~AOC4~~-2SW05
Matrix :WATER SS07

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 17:20 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA.**THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons VPH	0.020	U	mg/L	EPA 5030/8015M		09/13	09/13	WLS
Hydrocarbons EPH	0.150	U	mg/L	3510/3550/8100M		09/13	09/15	JBH
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromoform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloromethane	0.0026	B	mg/L	EPA 8260		09/20	09/20	KWM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
12Dibromo3Chloropropane	**		mg/L	EPA 8260				
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-4
Client Sample ID :LAY-~~AOC4~~-2SW05
Matrix :WATER SS07

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Ethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Hexachlorobutadiene	**		mg/L	EPA 8260			
Isopropylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Methylene Chloride	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Napthalene	**		mg/L	EPA 8260			
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Styrene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Toluene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichlorobenzene	**		mg/L	EPA 8260			
1,2,4-Trichlorobenzene	**		mg/L	EPA 8260			
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Trichloroethene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/20	09/20	[illegible]
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-5
Client Sample ID :LAY-~~AOC4~~-2SW06 SS07
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 17:30 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL. **THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons VPH	0.020	U	mg/L	EPA 5030/8015M		09/13	09/13	WLS
Hydrocarbons EPH	0.26		mg/L	3510/3550/8100M		09/13	09/15	JBH
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromoform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloromethane	0.0036	B	mg/L	EPA 8260		09/20	09/20	KWM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
12Dibromo3Chloropropane	**		mg/L	EPA 8260				
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-5
Client Sample ID :LAY-~~AOC4~~-2SW06
Matrix :WATER SS07

1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Ethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Hexachlorobutadiene	**	U	mg/L	EPA 8260	09/20	09/20	KWM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Methylene Chloride	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Napthalene	**		mg/L	EPA 8260			
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Styrene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Toluene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichlorobenzene	**		mg/L	EPA 8260			
1,2,4-Trichlorobenzene	**		mg/L	EPA 8260			
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Trichloroethene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM

===

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

6.19.95

ICF ID	LAY-~~AOC4~~ SS07-SD01	LAY-~~AOC4~~ SS07-SD02	LAY-~~AOC4~~ SS07-SD03
F&BI Number	628	630	632
Sample Type	soil	soil	soil
Date Received	8/25/93	8/25/93	8/25/93
% Dry Weight	53	76	62
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93
Leaded Gas			
JP-4	<60	<60	<60
Lube Oil	<120	<120	<120
Diesel	~~<60~~ <90	<60	~~<60~~ <80
Spike Level			
Unknown Semi-volatile			
Pentacosane	106	118	110
Sequence Date			
PCB 1221			
PCB 1232			
PCB 1016			
PCB 1242			
PCB 1248			
PCB 1254			
PCB 1260			
Spike Level			
Dibutyl Chlorendate			
Sequence Date			
alpha-BHC			
beta-BHC			
gamma-BHC			
delta-BHC			
Heptachlor			
Aldrin			
Heptachlor Epoxide			
Endosulfan I			
DDE			
Dieldrin			
Endrin			
Endosulfan II			
DDD			
Endrin Aldehyde			
DDT			
Endosulfan Sulfate			
Endrin Ketone			
Methoxy Chlor			
Chlordane			
Dibutyl Chlorendate			
Spike Level			
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93
CCl4			
TCA			
Benzene	<0.04	<0.03	<0.03
TCE			
Toluene	<0.04	<0.03	<0.03
PCE			
Ethylbenzene	<0.04	<0.03	<0.03
Xylenes	<0.08	<0.06	<0.06
Gasoline	<4 J	<4 J	<3 J
Spike level			
BFB	89	94	94

RJB
6-14-95

ICF ID	SS07 LAY-~~AOC4~~-SD04	SS07 LAY-~~AOC4~~-SW01	SS07 LAY-~~AOC4~~-SW01
F&BI Number	634	558	582
Sample Type	soil	water	water
Date Received	8/25/93	8/25/93	8/25/93
% Dry Weight	73		
Sequence Date	#5-08/25/93	#5-08/27/93	
Leaded Gas			
JP-4	<60	<1000	
Lube Oil	<120	<2000	
Diesel	<60	<1000	
Spike Level			
Unknown Semi-volatile			
Pentacosane	110	151	
Sequence Date		#5-08/27/93	
PCB 1221		<2	
PCB 1232		<2	
PCB 1016		<2	
PCB 1242		<2	
PCB 1248		<2	
PCB 1254		<2	
PCB 1260		<2	
Spike Level			
Dibutyl Chlorendate		150	
Sequence Date			
alpha-BHC			
beta-BHC			
gamma-BHC			
delta-BHC			
Heptachlor			
Aldrin			
Heptachlor Epoxide			
Endosulfan I			
DDE			
Dieldrin			
Endrin			
Endosulfan II			
DDD			
Endrin Aldehyde			
DDT			
Endosulfan Sulfate			
Endrin Ketone			
Methoxy Chlor			
Chlordane			
Dibutyl Chlorendate			
Spike Level			
Vol Sequence	#1&2-08/25/93		#3&4-08/25/93
CCl4			<1
TCA			<1
Benzene	0.07 J		<1
TCE			4
Toluene	0.04		<1
PCE			2
Ethylbenzene	0.2		5 J
Xylenes	0.4 J		~~5~~ 12 J
Gasoline	3 J		~~<50~~ < 100 J
Spike level			
BFB	94		97

gnf 6.19.95

RJB 6-14-95

gmf 6.19.95

ICF ID	LAY-~~AOC4~~SS07-SW02	LAY-~~AOC4~~SS07-SW02	LAY-~~AOC4~~SS07-SW03
F&BI Number	584	586	588
Sample Type	water	water	water
Date Received	8/25/93	8/25/93	8/25/93
% Dry Weight			
Sequence Date	#5-08/27/93		#5-08/27/93
Leaded Gas			
JP-4	<1000		<1000
Lube Oil	<2000		<2000
Diesel	<1000		<1000
Spike Level			
Unknown Semi-volatile			
Pentacosane	116		96
Sequence Date			
PCB 1221			
PCB 1232			
PCB 1016			
PCB 1242			
PCB 1248			
PCB 1254			
PCB 1260			
Spike Level			
Dibutyl Chlorendate			
Sequence Date			
alpha-BHC			
beta-BHC			
gamma-BHC			
delta-BHC			
Heptachlor			
Aldrin			
Heptachlor Epoxide			
Endosulfan I			
DDE			
Dieldrin			
Endrin			
Endosulfan II			
DDD			
Endrin Aldehyde			
DDT			
Endosulfan Sulfate			
Endrin Ketone			
Methoxy Chlor			
Chlordane			
Dibutyl Chlorendate			
Spike Level			
Vol Sequence		#3&4-08/25/93	
CCl4		<1	
TCA		<1	
Benzene		<1	
TCE		<1	
Toluene		<1	
PCE		<1	
Ethylbenzene		<1	
Xylenes		<2	
Gasoline		~~≤50~~ <100 J	
Spike level			
BFB		112	

RSB 6-14-95

SMP 6.19.95

ICF ID	LAY-~~AOC4~~ SS07-SW03
F&BI Number	589
Sample Type	water
Date Received	8/25/93
% Dry Weight	
Sequence Date	
Leaded Gas	
JP-4	
Lube Oil	
Diesel	
Spike Level	
Unknown Semi-volatile	
Pentacosane	
Sequence Date	
PCB 1221	
PCB 1232	
PCB 1016	
PCB 1242	
PCB 1248	
PCB 1254	
PCB 1260	
Spike Level	
Dibutyl Chlorendate	
Sequence Date	
alpha-BHC	
beta-BHC	
gamma-BHC	
delta-BHC	
Heptachlor	
Aldrin	
Heptachlor Epoxide	
Endosulfan I	
DDE	
Dieldrin	
Endrin	
Endosulfan II	
DDD	
Endrin Aldehyde	
DDT	
Endosulfan Sulfate	
Endrin Ketone	
Methoxy Chlor	
Chlordane	
Dibutyl Chlorendate	
Spike Level	
Vol Sequence	#3&4-08/25/93
CCl4	<1
TCA	<1
Benzene	<1
TCE	~~<1~~ 133
Toluene	<1
PCE	<1
Ethylbenzene	<1
Xylenes	<2
Gasoline	~~<50~~ < 100 J
Spike level	
BFB	100

RJB 6-14-95

ANALYTICAL DATA SHEETS FOR CRUSHED DRUM AREA (SS08)

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-2
Client Sample ID :LAY-~~AOC5~~-S06 POINT LAY
Matrix :SOIL ~~SS08~~

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70058
Report Completed :10/08/93
Collected :08/23/93 @ 13:15 hrs
Received :08/25/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromobenzene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromochloromethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromodichloromethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromoform	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromomethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
n-Butylbenzene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
sec-Butylbenzene	4.95	D	mg/Kg	EPA 8260		08/26	09/05	MCM
tert-Butylbenzne	1.98	D	mg/Kg	EPA 8260		08/26	09/05	MCM
Carbon Tetrachloride	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chlorobenzene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroform	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloromethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2-Chlorotoluene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
4-Chlorotoluene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromochloromethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
12Dibromo3Chloropropane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dibromoethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromomethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichlorobenzene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichlorobenzene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,4-Dichlorobenzene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dichlorodifluoromethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloroethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
cis-1,2-Dichloroethene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
trans1,2-Dichloroethene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloropropane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichloropropane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2,2-Dichloropropane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloropropene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Ethylbenzene	1.55	D	mg/Kg	EPA 8260		08/26	09/05	MCM
Hexachlorobutadiene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Isopropylbenzene	1.18	D	mg/Kg	EPA 8260		08/26	09/05	MCM
p-Isopropyltoluene	1.94	D	mg/Kg	EPA 8260		08/26	09/05	MCM

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B[illegible]
ANCHORAGE, A[illegible]8
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-2
Client Sample ID :LAY-~~A005~~-S06 POINT LAY
Matrix :SOIL SS08

		Qualifier		Comment			
2-Nitroaniline	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Dimethylphthalate	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Acenaphthylene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
2,6-Dinitrotoluene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
3-Nitroaniline	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Acenaphthene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
2,4-Dinitrophenol	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
4-Nitrophenol	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Dibenzofuran	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
2,4-Dinitrotoluene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Diethylphthalate	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
4-Chlorophenyl-Phenylet	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Fluorene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
4-Nitroaniline	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
4,6-Dinitro-2-Methylphe	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
n-Nitrosodiphenylamine	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
4-Bromophenyl-Phenyleth	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Hexachlorobenzene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Pentachlorophenol	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Phenanthrene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Anthracene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
di-n-Butylphthalate	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Fluoranthene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Pyrene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	[illegible]TT
Butylbenzylphthalate	0.230	U	mg/Kg		EPA 8270	09/06 09/29	[illegible]T
3,3-Dichlorobenzidine	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Benzo(a)Anthracene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Chrysene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
bis(2-Ethylhexyl)Phthal	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
di-n-Octylphthalate	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Benzo(b)Fluoranthene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Benzo(k)Fluoranthene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Benzo(a)Pyrene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Indeno(1,2,3-cd)Pyrene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Dibenz(a,h)Anthracene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Benzo(g,h,i)Perylene	0.230	U	mg/Kg		EPA 8270	09/06 09/29	MTT
Sample Preparation	---				EPA 3050 Digest		
Total Metals Analysis	---				-		
ICP Screen, ICF					EPA n/a		
Aluminum	3400	D	mg/Kg		EPA 6010	08/31 09/02	DLG
Antimony	56	U J	mg/Kg	1,2	EPA 6010	08/31 09/02	DLG
Arsenic	56	U	mg/Kg		EPA 6010	08/31 09/02	DLG
Barium	360		mg/Kg		EPA 6010	08/31 09/02	DLG
Beryllium	2.8	U	mg/Kg		EPA 6010	08/31 09/02	DLG
Cadmium	2.8	U	mg/Kg		EPA 6010	08/31 09/02	DLG
Calcium	1200		mg/Kg		EPA 6010	08/31 09/02	DLG
Chromium	6.7		mg/Kg		EPA 6010	08/31 09/02	DLG
Cobalt	5.6	U	mg/Kg		EPA 6010	08/31 09/02	DLG
Copper	8.6		mg/Kg		EPA 6010	08/31 09/02	DLG
Iron	23000		mg/Kg		EPA 6010	08/31 09/02	DLG

All chngs n.c 2/2/94

SGS Member of the SGS Group (Société Générale de Surveillance)

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-2
Client Sample ID :LAY-~~AOC5~~-S06 POINT LAY
Matrix :SOIL SS08

		Qualifier		Comment				
Lead	5.6	U	mg/Kg		EPA 6010	08/31	09/02	DLG
Magnesium	1600	J	mg/Kg	J	EPA 6010	08/31	09/02	DLG
Manganese	220	J	mg/Kg	J.2	EPA 6010	08/31	09/02	DLG
Molybdenum	2.8	U	mg/Kg		EPA 6010	08/31	09/02	DLG
Nickel	15		mg/Kg		EPA 6010	08/31	09/02	DLG
Potassium	590		mg/Kg		EPA 6010	08/31	09/06	DLG
Selenium	17	J	mg/Kg	J.2	EPA 6010	08/31	09/02	DLG
Silver	28	U R	mg/Kg	J.1	EPA 6010	08/31	09/02	DLG
Sodium	94		mg/Kg		EPA 6010	08/31	09/06	DLG
Thallium	0.28	U	mg/Kg		EPA 7841	08/30	09/01	KAW
Vanadium	19		mg/Kg		EPA 6010	08/31	09/02	DLG
Zinc	37		mg/Kg		EPA 6010	08/31	09/02	DLG

All changes s.c. 2/2/94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-4
Client Sample ID :LAY-~~AOC5~~-S06 POINT LAY DUPLICATE
Matrix :SOIL SSOB Sub 12.6.95

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70058
Ordered By	:RAY MORRIS	Report Completed	:10/08/93
Project Name	:DEW LINE RI/FS	Collected	:08/23/93 @ 13:15 hrs
Project#	:41096-412-01	Received	:08/25/93 @ 12:00 hrs
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	:

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Sample Preparation	---			EPA 3050 Digest				
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	3100		mg/Kg	EPA 6010		08/31	09/02	DLG
Antimony	56	U	mg/Kg	EPA 6010		08/31	09/02	DLG
Arsenic	56	U	mg/Kg	EPA 6010		08/31	09/02	DLG
Barium	420		mg/Kg	EPA 6010		08/31	09/02	DLG
Beryllium	2.8	U	mg/Kg	EPA 6010		08/31	09/02	DLG
Cadmium	2.8	U	mg/Kg	EPA 6010		08/31	09/02	DLG
Calcium	1400		mg/Kg	EPA 6010		08/31	09/02	[illegible]
Chromium	9.7		mg/Kg	EPA 6010		08/31	09/02	DLG
Cobalt	5.6	U	mg/Kg	EPA 6010		08/31	09/02	DLG
Copper	9.2		mg/Kg	EPA 6010		08/31	09/02	DLG
Iron	23000		mg/Kg	EPA 6010		08/31	09/02	DLG
Lead	16		mg/Kg	EPA 6010		08/31	09/02	DLG
Magnesium	1300		mg/Kg	EPA 6010		08/31	09/02	DLG
Manganese	210		mg/Kg	EPA 6010		08/31	09/02	DLG
Molybdenum	2.8	U	mg/Kg	EPA 6010		08/31	09/02	DLG
Nickel	13		mg/Kg	EPA 6010		08/31	09/02	DLG
Potassium	610		mg/Kg	EPA 6010		08/31	09/06	DLG
Selenium	56	U	mg/Kg	EPA 6010		08/31	09/02	DLG
Silver	28	U	mg/Kg	EPA 6010		08/31	09/02	DLG
Sodium	95		mg/Kg	EPA 6010		08/31	09/06	DLG
Thallium	0.28	U	mg/Kg	EPA 7841		08/30	09/01	KAW
Vanadium	18		mg/Kg	EPA 6010		08/31	09/02	DLG
Zinc	34		mg/Kg	EPA 6010		08/31	09/02	DLG

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-3
Client Sample ID :LAY-~~A005~~-S06 POINT LAY SPIKE
SS08
Matrix :SOIL
SWF
12.6.93

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70058
Report Completed :10/08/93
Collected :08/23/93 @ 13:15 hrs
Received :08/25/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. FOR QC RESULTS PLEASE SEE QC SUMMARY.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics				EPA 8270				
Phenol	1.62		mg/Kg	EPA 8270		09/06	09/29	MTT
bis(2-Chloroethyl)ether	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2-Chlorophenol	1.61		mg/Kg	EPA 8270		09/06	09/29	MTT
1,3-Dichlorobenzene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
1,4-Dichlorobenzene	1.52		mg/Kg	EPA 8270		09/06	09/29	MTT
Benzyl Alcohol	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
1,2-Dichlorobenzene	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2-Methylphenol	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
bis(2-Chloroisopropyl)e	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
4-Methylphenol	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
n-Nitroso-di-n-Propylam	1.67		mg/Kg	EPA 8270		09/06	09/29	MTT
Hexachloroethane	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Nitrobenzene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Isophorone	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2-Nitrophenol	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2,4-Dimethylphenol	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Benzoic Acid	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
bis(2-Chloroethoxy)Meth	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2,4-Dichlorophenol	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
1,2,4-Trichlorobenzene	1.88		mg/Kg	EPA 8270		09/06	09/29	MTT
Naphthalene	1.99		mg/Kg	EPA 8270		09/06	09/29	MTT
4-Chloroaniline	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Hexachlorobutadiene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
4-Chloro-3-Methylphenol	1.49		mg/Kg	EPA 8270		09/06	09/29	MTT
2-Methylnaphthalene	3.09		mg/Kg	EPA 8270		09/06	09/29	MTT
Hexachlorocyclopentadie	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2,4,6-Trichlorophenol	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2,4,5-Trichlorophenol	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2-Chloronaphthalene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2-Nitroaniline	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Dimethylphthalate	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Acenaphthylene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2,6-Dinitrotoluene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
3-Nitroaniline	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Acenaphthene	1.47		mg/Kg	EPA 8270		09/06	09/29	MTT
2,4-Dinitrophenol	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS ECK

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-3
Client Sample ID :LAY-~~AOC5~~-S06 POINT LAY SPIKE
Matrix :SOIL SS08 auf 12-695

4-Nitrophenol	2.15		mg/Kg	EPA 8270		09/06	09/29	MTT
Dibenzofuran	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2,4-Dinitrotoluene	2.28		mg/Kg	EPA 8270		09/06	09/29	MTT
Diethylphthalate	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
4-Chlorophenyl-Phenylet	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Fluorene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
4-Nitroaniline	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
4,6-Dinitro-2-Methylphe	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
n-Nitrosodiphenylamine	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
4-Bromophenyl-Phenyleth	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Hexachlorobenzene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Pentachlorophenol	3.28		mg/Kg	EPA 8270		09/06	09/29	MTT
Phenanthrene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Anthracene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
di-n-Butylphthalate	2.47		mg/Kg	EPA 8270		09/06	09/29	MTT
Fluoranthene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Pyrene	2.13		mg/Kg	EPA 8270		09/06	09/29	MTT
Butylbenzylphthalate	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
3,3-Dichlorobenzidine	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Benzo(a)Anthracene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Chrysene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
bis(2-Ethylhexyl)Phthal	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
di-n-Octylphthalate	0.230	U	mg/Kg	EPA 8270		09/06	09/29	[illegible]
Benzo(b)Fluoranthene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	[illegible]
Benzo(k)Fluoranthene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Benzo(a)Pyrene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	[illegible]
Indeno(1,2,3-cd)Pyrene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	[illegible]
Dibenz(a,h)Anthracene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	[illegible]
Benzo(g,h,i)Perylene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Sample Preparation	---			EPA 3050 Digest				
Total Metals Analysis	---			-				
ICP Screen, ICP				EPA	n/a			
Aluminum	4060		mg/Kg	EPA 6010		08/31	09/02	DLG
Antimony	540		mg/Kg	EPA 6010		08/31	09/02	DLG
Arsenic	140		mg/Kg	EPA 6010		08/31	09/02	DLG
Barium	490		mg/Kg	EPA 6010		08/31	09/02	DLG
Beryllium	45		mg/Kg	EPA 6010		08/31	09/02	DLG
Cadmium	53		mg/Kg	EPA 6010		08/31	09/02	DLG
Calcium	2300		mg/Kg	EPA 6010		08/31	09/02	DLG
Chromium	120		mg/Kg	EPA 6010		08/31	09/02	DLG
Cobalt	110		mg/Kg	EPA 6010		08/31	09/02	DLG
Copper	100		mg/Kg	EPA 6010		08/31	09/02	DLG
Iron	24000		mg/Kg	EPA 6010		08/31	09/02	DLG
Lead	100		mg/Kg	EPA 6010		08/31	09/02	DLG
Magnesium	2400		mg/Kg	EPA 6010		08/31	09/02	DLG
Manganese	830		mg/Kg	EPA 6010		08/31	09/02	DLG
Molybdenum	100		mg/Kg	EPA 6010		08/31	09/02	DLG
Nickel	120		mg/Kg	EPA 6010		08/31	09/02	DLG
Potassium	1700		mg/Kg	EPA 6010		08/31	09/06	DLG
Selenium	145		mg/Kg	EPA 6010		08/31	09/02	[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-3
Client Sample ID :LAY-~~AOC5~~-S06 POINT LAY SPIKE
Matrix :SOIL SS08 12.6.95

Silver	97	mg/Kg	EPA 6010	08/31	09/02	DLC
Sodium	1100	mg/Kg	EPA 6010	08/31	09/06	DLC
Thallium	2.3	mg/Kg	EPA 7841	08/30	09/01	KAH
Vanadium	120	mg/Kg	EPA 6010	08/31	09/02	DLC
Zinc	140	mg/Kg	EPA 6010	08/31	09/02	DLC

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-10
Client Sample ID :LAY-~~AOC5~~-S06 POINT LAY SPIKE DUPLICATE
Matrix :SOIL SS08 SUC 12693

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70058
Report Completed :10/08/93
Collected :08/23/93 @ 13:15 hr
Received :08/25/93 @ 12:00 hr
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. 8270: SAMPLE IS SPIKED WITH 100 PPM SPIKE, INTERNAL STANDARD WAS ADDED TWICE, SAMPLE CONCENTRATION MUST BE MULTIPLIED BY TWO TO COMPENSATE FOR THIS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics				EPA 8270				
Phenol	0.628		mg/Kg	EPA 8270		09/06	09/29	MTT
bis(2-Chloroethyl)ether	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2-Chlorophenol	0.502		mg/Kg	EPA 8270		09/06	09/29	MTT
1,3-Dichlorobenzene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
1,4-Dichlorobenzene	0.380		mg/Kg	EPA 8270		09/06	09/29	MTT
Benzyl Alcohol	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
1,2-Dichlorobenzene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2-Methylphenol	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
bis(2-Chloroisopropyl)e	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
4-Methylphenol	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
n-Nitroso-di-n-Propylam	0.702		mg/Kg	EPA 8270		09/06	09/29	MTT
Hexachloroethane	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Nitrobenzene	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Isophorone	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2-Nitrophenol	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2,4-Dimethylphenol	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Benzoic Acid	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
bis(2-Chloroethoxy)Meth	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2,4-Dichlorophenol	0.23	U	mg/Kg	EPA 8270		09/06	09/29	MTT
1,2,4-Trichlorobenzene	0.654		mg/Kg	EPA 8270		09/06	09/29	MTT
Naphthalene	0.598		mg/Kg	EPA 8270		09/06	09/29	MTT
4-Chloroaniline	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Hexachlorobutadiene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
4-Chloro-3-Methylphenol	0.776		mg/Kg	EPA 8270		09/06	09/29	MTT
2-Methylnaphthalene	2.00		mg/Kg	EPA 8270		09/06	09/29	MTT
Hexachlorocyclopentadie	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2,4,6-Trichlorophenol	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2,4,5-Trichlorophenol	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2-Chloronaphthalene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2-Nitroaniline	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Dimethylphthalate	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Acenaphthylene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
2,6-Dinitrotoluene	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
3-Nitroaniline	0.230	U	mg/Kg	EPA 8270		09/06	09/29	MTT
Acenaphthene	0.968		mg/Kg	EPA 8270		09/06	09/29	MTT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-10
Client Sample ID :LAY-~~A0C5~~-S06 POINT LAY SPIKE DUPLICATE
Matrix :SOIL SS08 12.6.95

2,4-Dinitrophenol	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
4-Nitrophenol	0.904		mg/Kg	EPA 8270	09/06	09/29	MTT
Dibenzofuran	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
2,4-Dinitrotoluene	1.28		mg/Kg	EPA 8270	09/06	09/29	MTT
Diethylphthalate	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
4-Chlorophenyl-Phenylet	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Fluorene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
4-Nitroaniline	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
4,6-Dinitro-2-Methylphe	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
n-Nitrosodiphenylamine	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
4-Bromophenyl-Phenyleth	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Hexachlorobenzene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Pentachlorophenol	1.82		mg/Kg	EPA 8270	09/06	09/29	MTT
Phenanthrene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Anthracene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
di-n-Butylphthalate	1.76		mg/Kg	EPA 8270	09/06	09/29	MTT
Fluoranthene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Pyrene	1.50		mg/Kg	EPA 8270	09/06	09/29	MTT
Butylbenzylphthalate	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
3,3-Dichlorobenzidine	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Benzo(a)Anthracene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Chrysene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
bis(2-Ethylhexyl)Phthal	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
di-n-Octylphthalate	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Benzo(b)Fluoranthene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Benzo(k)Fluoranthene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Benzo(a)Pyrene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Indeno(1,2,3-cd)Pyrene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Dibenz(a,h)Anthracene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Benzo(g,h,i)Perylene	0.230	U	mg/Kg	EPA 8270	09/06	09/29	MTT

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B ST
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-i
Client Sample ID :LAY-~~AOC5~~-2S08 POINT LAY
Matrix :SOIL SS08

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70764	
Ordered By	:SHERI K ACE	Report Completed	:11/09/93	
Project Name	:DEWLINE RI/FS	Collected	:09/07/93	@ 14:35 hrs
Project#	:41096-412-01	Received	:09/09/93	@ 12:00 hrs
PWSID	:UA	Technical Director	:STEPHEN C. EDE	
		Released By	: C. Homestead	

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. 8270: UNABLE TO ANALYZE. SAMPLE LOST DURING EXTRACTION PROCESS.

Qualifier/Comments

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	93.1		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	3050	D	mg/Kg	3510/3550/8100M		09/14	09/20	JBH
Hydrocarbons VPH	22.6		mg/Kg	EPA 5030/8015M		09/10	09/18	WLS
Volatile Organics				EPA 8260				
Benzene	0.100	U	mg/Kg	EPA 8260	(J)-A.1	09/10	10/01	KWM
Bromobenzene	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromochloromethane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromodichloromethane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromoform	0.100	U	mg/Kg	EPA 8260		09/10	10/01	[illegible]M
Bromomethane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
n-Butylbenzene	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
sec-Butylbenzene	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
tert-Butylbenzne	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Carbon Tetrachloride	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chlorobenzene	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloroethane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloroform	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloromethane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
2-Chlorotoluene	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
4-Chlorotoluene	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dibromochloromethane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
12Dibromo3Chloropropane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dibromoethane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dibromomethane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichlorobenzene	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,3-Dichlorobenzene	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,4-Dichlorobenzene	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dichlorodifluoromethane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,1-Dichloroethane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichloroethane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,1-Dichloroethene	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
cis-1,2-Dichloroethene	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
trans1,2-Dichloroethene	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichloropropane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,3-Dichloropropane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM
2,2-Dichloropropane	0.100	U	mg/Kg	EPA 8260		09/10	10/01	KWM

Cas 2-2-94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-1
Client Sample ID :LAY-~~AOC5~~-2S08 POINT LAY
Matrix :SOIL 55P8

Qualifier/Comments

1,1-Dichloropropene	0.100	U	mg/Kg	EPA 8260 (J)-A.1	09/10	10/01	KWM
Ethylbenzene	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Hexachlorobutadiene	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Isopropylbenzene	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
p-Isopropyltoluene	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Methylene Chloride	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Napthalene	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
n-Propylbenzene	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Styrene	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1112-Tetrachloroethane	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1122-Tetrachloroethane	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Tetrachloroethene	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Toluene	0.308	D	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,3-Trichlorobenzene	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,4-Trichlorobenzene	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,1,1-Trichloroethane	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,1,2-Trichloroethane	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Trichloroethene	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Trichlorofluoromethane	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,3-Trichloropropane	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,4-Trimethylbenzene	0.264	D	mg/Kg	EPA 8260	09/10	10/01	KWM
1,3,5-Trimethylbenzene	0.153	D	mg/Kg	EPA 8260	09/10	10/01	KWM
Vinyl Chloride	0.100	U	mg/Kg	EPA 8260	09/10	10/01	KWM
p+m-Xylene	0.348	D	mg/Kg	EPA 8260	09/10	10/01	KWM
o-Xylene	0.142	D	mg/Kg	EPA 8260	09/10	10/01	KWM

8
2-2-94

==

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-2
Client Sample ID :LAY-~~A0C5~~-2S08 SPIKE
Matrix :SOIL SS08 8W 12.6.95

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 14:35 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLL. BY: SMF AND RCC. FOR SPIKING CONC. AND % RECOVERIES, SEE QA/QC PACKAGE. FOR 8260 SPIKE & SPIKE DUP., SEE WO# 93.4727-12,13. B= THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE. J= INDICATES AN ANALYTE WHOSE CONC. IS EST. BECAUSE THE ANALYTE'S CONC. IS DETECTED BELOW THE CALIBRATION RANGE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	93.1		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	3470	D	mg/Kg	3510/3550/8100M		09/14	09/20	JBH
Hydrocarbons VPH	1230	D	mg/Kg	EPA 5030/8015M		09/10	09/18	WLS
Semivolatile Organics				EPA 8270				
Phenol	1.82	J	mg/Kg	EPA 8270		09/17	10/25	GV
bis(2-Chloroethyl)ether	2.14	U	mg/Kg	EPA 8270		09/17	10/25	V
2-Chlorophenol	1.67	J	mg/Kg	EPA 8270		09/17	10/25	GV
1,3-Dichlorobenzene	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
1,4-Dichlorobenzene	1.66	J	mg/Kg	EPA 8270		09/17	10/25	GV
Benzyl Alcohol	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
1,2-Dichlorobenzene	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
2-Methylphenol	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
bis(2-Chloroisopropyl)e	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
4-Methylphenol	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
n-Nitroso-di-n-Propylam	1.93	J	mg/Kg	EPA 8270		09/17	10/25	GV
Hexachloroethane	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
Nitrobenzene	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
Isophorone	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
2-Nitrophenol	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
2,4-Dimethylphenol	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
Benzoic Acid	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
bis(2-Chloroethoxy)Meth	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
2,4-Dichlorophenol	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
1,2,4-Trichlorobenzene	1.98	J	mg/Kg	EPA 8270		09/17	10/25	GV
Naphthalene	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
4-Chloroaniline	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
Hexachlorobutadiene	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
4-Chloro-3-Methylphenol	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
2-Methylnaphthalene	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
Hexachlorocyclopentadie	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
2,4,6-Trichlorophenol	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
2,4,5-Trichlorophenol	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV
2-Chloronaphthalene	2.14	U	mg/Kg	EPA 8270		09/17	10/25	GV

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-2
Client Sample ID :LAY-~~AOC5~~-2S08 SPIKE SS08
Matrix :SOIL

DMP 12.6.95

2-Nitroaniline	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Dimethylphthalate	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Acenaphthylene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
2,6-Dinitrotoluene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
3-Nitroaniline	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Acenaphthene	4.64		mg/Kg	EPA 8270	09/17 10/25	GV
2,4-Dinitrophenol	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
4-Nitrophenol	4.66		mg/Kg	EPA 8270	09/17 10/25	GV
Dibenzofuran	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
2,4-Dinitrotoluene	2.75		mg/Kg	EPA 8270	09/17 10/25	GV
Diethylphthalate	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
4-Chlorophenyl-Phenylet	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Fluorene	2.99		mg/Kg	EPA 8270	09/17 10/25	GV
4-Nitroaniline	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
4,6-Dinitro-2-Methylphe	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
n-Nitrosodiphenylamine	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
4-Bromophenyl-Phenyleth	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Hexachlorobenzene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Pentachlorophenol	0.207	J	mg/Kg	EPA 8270	09/17 10/25	GV
Phenanthrene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Anthracene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
di-n-Butylphthalate	7.79	B	mg/Kg	EPA 8270	09/17 10/25	GV
Fluoranthene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Pyrene	6.52		mg/Kg	EPA 8270	09/17 10/25	GV
Butylbenzylphthalate	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
3,3-Dichlorobenzidine	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Benzo(a)Anthracene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Chrysene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
bis(2-Ethylhexyl)Phthal	4.24		mg/Kg	EPA 8270	09/17 10/25	GV
di-n-Octylphthalate	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Benzo(b)Fluoranthene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Benzo(k)Fluoranthene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Benzo(a)Pyrene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Indeno(1,2,3-cd)Pyrene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Dibenz(a,h)Anthracene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV
Benzo(g,h,i)Perylene	2.14	U	mg/Kg	EPA 8270	09/17 10/25	GV

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-3
Client Sample ID :LAY-~~AOC5~~-2S08 SPIKE DUPLICATE
Matrix :SOIL SS08 SWIF 12695

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 14:35 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : C. Homestead

Sample Remarks: SAMPLE COLL. BY: SMF AND RCC. FOR 8260 SPIKE AND SPIKE DUP., SEE WO# 93.4727-12,13. FOR SPIKING CONC. AND % RECOVERIES, SEE QA/QC PACKAGE. B= THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSIATED BLANK AS WELL AS IN THE SAMPLE. J= INDICATES AN ANALYTE WHOSE CONC. IS EST. BECAUSE THE ANALYTE'S CONC. IS DETECTED BELOW THE CALIBRATION RANGE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	93.1		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	4040	D	mg/Kg	3510/3550/8100M		09/14	09/21	JBH
Hydrocarbons VPH	1120	D	mg/Kg	EPA 5030/8015M		09/10	09/18	WLS
Semivolatile Organics				EPA 8270				
Phenol	1.73	J	mg/Kg	EPA 8270		09/17	10/25	GV
bis(2-Chloroethyl)ether	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
2-Chlorophenol	1.59	J	mg/Kg	EPA 8270		09/17	10/25	GV
1,3-Dichlorobenzene	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
1,4-Dichlorobenzene	1.60	J	mg/Kg	EPA 8270		09/17	10/25	GV
Benzyl Alcohol	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
1,2-Dichlorobenzene	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
2-Methylphenol	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
bis(2-Chloroisopropyl)e	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
4-Methylphenol	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
n-Nitroso-di-n-Propylam	1.90	J	mg/Kg	EPA 8270		09/17	10/25	GV
Hexachloroethane	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
Nitrobenzene	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
Isophorone	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
2-Nitrophenol	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
2,4-Dimethylphenol	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
Benzoic Acid	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
bis(2-Chloroethoxy)Meth	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
2,4-Dichlorophenol	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
1,2,4-Trichlorobenzene	1.81	J	mg/Kg	EPA 8270		09/17	10/25	GV
Naphthalene	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
4-Chloroaniline	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
Hexachlorobutadiene	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
4-Chloro-3-Methylphenol	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
2-Methylnaphthalene	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
Hexachlorocyclopentadie	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
2,4,6-Trichlorophenol	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
2,4,5-Trichlorophenol	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV
2-Chloronaphthalene	2.13	U	mg/Kg	EPA 8270		09/17	10/25	GV

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-3
Client Sample ID :LAY-~~AOC5~~-2S08 SPIKE DUPLICATE
Matrix :SOIL ~~SS08~~ dup 12.6.95

2-Nitroaniline	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Dimethylphthalate	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Acenaphthylene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
2,6-Dinitrotoluene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
3-Nitroaniline	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Acenaphthene	4.75		mg/Kg	EPA 8270	09/17	10/25	GV
2,4-Dinitrophenol	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
4-Nitrophenol	4.10		mg/Kg	EPA 8270	09/17	10/25	GV
Dibenzofuran	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
2,4-Dinitrotoluene	2.38		mg/Kg	EPA 8270	09/17	10/25	GV
Diethylphthalate	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
4-Chlorophenyl-Phenylet	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Fluorene	3.07		mg/Kg	EPA 8270	09/17	10/25	GV
4-Nitroaniline	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
4,6-Dinitro-2-Methylphe	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
n-Nitrosodiphenylamine	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
4-Bromophenyl-Phenyleth	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Hexachlorobenzene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Pentachlorophenol	0.251	J	mg/Kg	EPA 8270	09/17	10/25	GV
Phenanthrene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Anthracene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
di-n-Butylphthalate	10.3	B	mg/Kg	EPA 8270	09/17	10/25	GV
Fluoranthene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Pyrene	7.17		mg/Kg	EPA 8270	09/17	10/25	GV
Butylbenzylphthalate	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
3,3-Dichlorobenzidine	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Benzo(a)Anthracene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Chrysene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
bis(2-Ethylhexyl)Phthal	4.25		mg/Kg	EPA 8270	09/17	10/25	GV
di-n-Octylphthalate	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Benzo(b)Fluoranthene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Benzo(k)Fluoranthene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Benzo(a)Pyrene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Indeno(1,2,3-cd)Pyrene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Dibenz(a,h)Anthracene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV
Benzo(g,h,i)Perylene	2.13	U	mg/Kg	EPA 8270	09/17	10/25	GV

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-4
Client Sample ID :LAY-~~AOC5~~-2S09 SS08
Matrix :SOIL

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70764
Ordered By	:SHERI K ACE	Report Completed	:11/09/93
Project Name	:DEWLINE RI/FS	Collected	:09/07/93 @ 14:40 hrs
Project#	:41096-412-01	Received	:09/09/93 @ 12:00 hrs
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	: [signature]

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE. J = INDICATES AS ANALYTE WHOSE CONCENTRATION IS ESTIMATED BECAUSE THE ANALYTE'S CONCENTRATION IS DETECTED BELOW THE CALIBRATION RANGE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	85.9		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	6290	D	mg/Kg	3510/3550/8100M		09/14	09/24	JBH
Hydrocarbons VPH	2430	D	mg/Kg	EPA 5030/8015M		09/10	09/18	WLS
Volatile Organics				EPA 8260				
Benzene	2.50	U	mg/Kg	EPA 8260		09/10	10/01	[illegible]M
Bromobenzene	2.50	U	mg/Kg	EPA 8260		09/10	10/01	[illegible]M
Bromochloromethane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromodichloromethane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromoform	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromomethane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
n-Butylbenzene	11.6	D	mg/Kg	EPA 8260		09/10	10/01	KWM
sec-Butylbenzene	5.03	D	mg/Kg	EPA 8260		09/10	10/01	KWM
tert-Butylbenzne	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Carbon Tetrachloride	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chlorobenzene	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloroethane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloroform	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloromethane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
2-Chlorotoluene	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
4-Chlorotoluene	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dibromochloromethane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
12Dibromo3Chloropropane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dibromoethane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dibromomethane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichlorobenzene	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,3-Dichlorobenzene	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,4-Dichlorobenzene	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dichlorodifluoromethane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,1-Dichloroethane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichloroethane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,1-Dichloroethene	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
cis-1,2-Dichloroethene	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
trans1,2-Dichloroethene	2.50	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichloropropane	2.50	U	mg/Kg	EPA 8260		09/10	10/01	[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-4
Client Sample ID :LAY-~~A0C5~~-2S09
Matrix :SOIL 5508

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

1,3-Dichloropropane	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
2,2-Dichloropropane	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,1-Dichloropropene	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Ethylbenzene	5.35	D	mg/Kg	EPA 8260	09/10	10/01	KWM
Hexachlorobutadiene	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Isopropylbenzene	3.23	D	mg/Kg	EPA 8260	09/10	10/01	KWM
p-Isopropyltoluene	6.04	D	mg/Kg	EPA 8260	09/10	10/01	KWM
Methylene Chloride	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Napthalene	26.2	D	mg/Kg	EPA 8260	09/10	10/01	KWM
n-Propylbenzene	7.88	D	mg/Kg	EPA 8260	09/10	10/01	KWM
Styrene	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1112-Tetrachloroethane	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1122-Tetrachloroethane	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Tetrachloroethene	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Toluene	5.72	D	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,3-Trichlorobenzene	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,4-Trichlorobenzene	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,1,1-Trichloroethane	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,1,2-Trichloroethane	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Trichloroethene	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Trichlorofluoromethane	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,3-Trichloropropane	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,4-Trimethylbenzene	48.0	D	mg/Kg	EPA 8260	09/10	10/01	KWM
1,3,5-Trimethylbenzene	19.6	D	mg/Kg	EPA 8260	09/10	10/01	KWM
Vinyl Chloride	2.50	U	mg/Kg	EPA 8260	09/10	10/01	KWM
p+m-Xylene	25.0	D	mg/Kg	EPA 8260	09/10	10/01	KWM
o-Xylene	13.1	D	mg/Kg	EPA 8260	09/10	10/01	KWM
Semivolatile Organics				EPA 8270			
Phenol	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
bis(2-Chloroethyl)ether	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
2-Chlorophenol	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
1,3-Dichlorobenzene	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
1,4-Dichlorobenzene	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
Benzyl Alcohol	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
1,2-Dichlorobenzene	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
2-Methylphenol	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
bis(2-Chloroisopropyl)e	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
4-Methylphenol	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
n-Nitroso-di-n-Propylam	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
Hexachloroethane	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
Nitrobenzene	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
Isophorone	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
2-Nitrophenol	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
2,4-Dimethylphenol	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
Benzoic Acid	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
bis(2-Chloroethoxy)Meth	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
2,4-Dichlorophenol	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
1,2,4-Trichlorobenzene	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV
Naphthalene	7.66		mg/Kg	EPA 8270	09/17	10/26	GV
4-Chloroaniline	2.28	U	mg/Kg	EPA 8270	09/17	10/26	GV

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-4
Client Sample ID :LAY-~~A0C5~~-2S09
Matrix :SOIL SS08

Hexachlorobutadiene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
4-Chloro-3-Methylphenol	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
2-Methylnaphthalene	11.7		mg/Kg	EPA 8270	09/17 10/26	GV
Hexachlorocyclopentadie	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
2,4,6-Trichlorophenol	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
2,4,5-Trichlorophenol	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
2-Chloronaphthalene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
2-Nitroaniline	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Dimethylphthalate	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Acenaphthylene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
2,6-Dinitrotoluene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
3-Nitroaniline	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Acenaphthene	1.85	J	mg/Kg	EPA 8270	09/17 10/26	GV
2,4-Dinitrophenol	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
4-Nitrophenol	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Dibenzofuran	1.83	J	mg/Kg	EPA 8270	09/17 10/26	GV
2,4-Dinitrotoluene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Diethylphthalate	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
4-Chlorophenyl-Phenylet	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Fluorene	1.95	J	mg/Kg	EPA 8270	09/17 10/26	GV
4-Nitroaniline	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
4,6-Dinitro-2-Methylphe	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
n-Nitrosodiphenylamine	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
4-Bromophenyl-Phenyleth	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Hexachlorobenzene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Pentachlorophenol	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Phenanthrene	2.44		mg/Kg	EPA 8270	09/17 10/26	GV
Anthracene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
di-n-Butylphthalate	8.48	B	mg/Kg	EPA 8270	09/17 10/26	GV
Fluoranthene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Pyrene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Butylbenzylphthalate	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
3,3-Dichlorobenzidine	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Benzo(a)Anthracene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Chrysene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
bis(2-Ethylhexyl)Phthal	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
di-n-Octylphthalate	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Benzo(b)Fluoranthene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Benzo(k)Fluoranthene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Benzo(a)Pyrene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Indeno(1,2,3-cd)Pyrene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Dibenz(a,h)Anthracene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV
Benzo(g,h,i)Perylene	2.28	U	mg/Kg	EPA 8270	09/17 10/26	GV

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected. Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-5
Client Sample ID :LAY-~~AOC5~~-2S10
Matrix :SOIL SS98

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 14:45 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : Homestead

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	63.8		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	17500	D	mg/Kg	3510/3550/8100M		09/14	09/21	JBH
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	2330	D	mg/Kg	EPA 5030/8015m		09/10	09/17	WLS
Benzene	4.00	U	mg/Kg	EPA 8020		09/10	09/17	WLS
Toluene	12.4	D	mg/Kg	EPA 8020		09/10	09/17	WLS
Ethylbenzene	18.2	D	mg/Kg	EPA 8020		09/10	09/17	WLS
p&m Xylene	60.2	D	mg/Kg	EPA 8020		09/10	09/17	WLS
o-Xylene	31.4	D	mg/Kg	EPA 8020		09/10	09/17	WLS

* See Special Instructions Above
See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-6
Client Sample ID :LAY-~~AOC5~~-2S10 SPIKE
Matrix :SOIL SSPB SWD 12.695

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70764
Ordered By	:SHERI K ACE	Report Completed	:11/09/93
Project Name	:DEWLINE RI/FS	Collected	:09/07/93 @ 14:45 hrs
Project#	:41096-412-01	Received	:09/09/93 @ 12:00 hrs
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	: C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. FOR SPIKING CONCENTRATIONS AND PERCENT RECOVERIES, SEE QA/QC PACKAGE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Aromatics-BTEX				ADEC 18AAC 78				
Benzene	30.2	D	mg/Kg	EPA 8020		09/10	09/17	WLS
Toluene	175	D	mg/Kg	EPA 8020		09/10	09/17	WLS
Ethylbenzene	50.4	D	mg/Kg	EPA 8020		09/10	09/17	WLS
p&m Xylene	178	D	mg/Kg	EPA 8020		09/10	09/17	WLS
o-Xylene	80.2	D	mg/Kg	EPA 8020		09/10	09/17	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-7
Client Sample ID :LAY-~~AOC5~~-2S10 SPIKE DUPLICATE SS08 SWC 12695
Matrix :SOIL

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70764
Ordered By	:SHERI K ACE	Report Completed	:11/09/93
Project Name	:DEWLINE RI/FS	Collected	:09/07/93 @ 14:45 hrs
Project#	:41096-412-01	Received	:09/09/93 @ 12:00 hrs
PWSID	:UA	Technical Director	:STEPHEN,C. EDE
		Released By	: C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. FOR SPIKING CONCENTRATIONS AND PERCENT RECOVERIES, SEE QA/QC PACKAGE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Aromatics-BTEX				ADEC 18AAC 78				
Benzene	29.8	D	mg/Kg	EPA 8020		09/10	09/17	WLS
Toluene	172	D	mg/Kg	EPA 8020		09/10	09/17	WLS
Ethylbenzene	49.9	D	mg/Kg	EPA 8020		09/10	09/17	WLS
p&m Xylene	176	D	mg/Kg	EPA 8020		09/10	09/17	WLS
o-Xylene	79.1	D	mg/Kg	EPA 8020		09/10	09/17	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-8
Client Sample ID :LAY-~~A0C5~~-2S11
Matrix :SOIL SS08

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 14:45 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	87.7		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	4.00	U	mg/Kg	3510/3550/8100M		09/14	09/21	JBH
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.500	U	mg/Kg	EPA 5030/8015m		09/10	09/17	WLS

Benzene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS
Toluene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS
Ethylbenzene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS
p&m Xylene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS
o-Xylene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS
	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-9
Client Sample ID :LAY-~~A0C5~~-2S12
Matrix :SOIL SS08

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 15:00 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	83.9		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	10.5		mg/Kg	3510/3550/8100M		09/14	09/21	JBH
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.500	U	mg/Kg	EPA 5030/8015m		09/10	09/17	WLS
Benzene	---							
Toluene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS
Ethylbenzene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS
p&m Xylene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS
o-Xylene	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS
	0.025	U	mg/Kg	EPA 8020		09/10	09/17	WLS

* See Special Instructions Above
† See Sample Remarks Above
U = Undetected. Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-10
Client Sample ID :LAY-~~A0C5~~-2S15
Matrix :SOIL SS08

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEWLINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70764
Report Completed :11/09/93
Collected :09/07/93 @ 14:50 hr:
Received :09/09/93 @ 12:00 hr:
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	90.3		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	4.19		mg/Kg	3510/3550/8100M		09/14	09/21	JBF
Hydrocarbons VPH	1.97		mg/Kg	EPA 5030/8015M		09/10	09/18	WLS
Volatile Organics				EPA 8260				
Benzene	0.021		mg/Kg	EPA 8260		09/10	10/01	KWM
Bromobenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromochloromethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromodichloromethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromoform	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Bromomethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
n-Butylbenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
sec-Butylbenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
tert-Butylbenzne	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Carbon Tetrachloride	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chlorobenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloroethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloroform	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Chloromethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
2-Chlorotoluene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
4-Chlorotoluene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dibromochloromethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
12Dibromo3Chloropropane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dibromoethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dibromomethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,3-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,4-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dichlorodifluoromethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,1-Dichloroethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichloroethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,1-Dichloroethene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
cis-1,2-Dichloroethene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
trans1,2-Dichloroethene	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dichloropropane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,3-Dichloropropane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-10
Client Sample ID :LAY-~~A0C5~~-2S15
Matrix :SOIL SS08

2,2-Dichloropropane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,1-Dichloropropene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Ethylbenzene	0.057		mg/Kg	EPA 8260	09/10	10/01	KWM
Hexachlorobutadiene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Isopropylbenzene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
p-Isopropyltoluene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Methylene Chloride	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Napthalene	0.100		mg/Kg	EPA 8260	09/10	10/01	KWM
n-Propylbenzene	0.023		mg/Kg	EPA 8260	09/10	10/01	KWM
Styrene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1112-Tetrachloroethane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1122-Tetrachloroethane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Tetrachloroethene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Toluene	0.240		mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,3-Trichlorobenzene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,4-Trichlorobenzene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,1,1-Trichloroethane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,1,2-Trichloroethane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Trichloroethene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
Trichlorofluoromethane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,3-Trichloropropane	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,2,4-Trimethylbenzene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
1,3,5-Trimethylbenzene	0.142		mg/Kg	EPA 8260	09/10	10/01	KWM
Vinyl Chloride	0.054		mg/Kg	EPA 8260	09/10	10/01	KWM
p+m-Xylene	0.020	U	mg/Kg	EPA 8260	09/10	10/01	KWM
o-Xylene	0.347		mg/Kg	EPA 8260	09/10	10/01	KWM
	0.153		mg/Kg	EPA 8260	09/10	10/01	KWM
Semivolatile Organics				EPA 8270			
Phenol	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
bis(2-Chloroethyl)ether	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
2-Chlorophenol	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
1,3-Dichlorobenzene	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
1,4-Dichlorobenzene	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
Benzyl Alcohol	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
1,2-Dichlorobenzene	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
2-Methylphenol	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
bis(2-Chloroisopropyl)e	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
4-Methylphenol	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
n-Nitroso-di-n-Propylam	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
Hexachloroethane	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
Nitrobenzene	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
Isophorone	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
2-Nitrophenol	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
2,4-Dimethylphenol	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
Benzoic Acid	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
bis(2-Chloroethoxy)Meth	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
2,4-Dichlorophenol	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
1,2,4-Trichlorobenzene	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
Naphthalene	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
4-Chloroaniline	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
Hexachlorobutadiene	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV
	0.220	U	mg/Kg	EPA 8270	09/17	10/26	GV

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4693-10
Client Sample ID :LAY-~~AOC5~~-2S15
Matrix :SOIL SS~~08~~

4-Chloro-3-Methylphenol	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
2-Methylnaphthalene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Hexachlorocyclopentadie	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
2,4,6-Trichlorophenol	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
2,4,5-Trichlorophenol	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
2-Chloronaphthalene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
2-Nitroaniline	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Dimethylphthalate	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Acenaphthylene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
2,6-Dinitrotoluene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
3-Nitroaniline	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Acenaphthene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
2,4-Dinitrophenol	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
4-Nitrophenol	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Dibenzofuran	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
2,4-Dinitrotoluene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Diethylphthalate	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
4-Chlorophenyl-Phenylet	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Fluorene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
4-Nitroaniline	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
4,6-Dinitro-2-Methylphe	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
n-Nitrosodiphenylamine	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
4-Bromophenyl-Phenyleth	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Hexachlorobenzene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Pentachlorophenol	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Phenanthrene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Anthracene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
di-n-Butylphthalate	1.95	B	mg/Kg	EPA 8270	09/17 10/26	GV
Fluoranthene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Pyrene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Butylbenzylphthalate	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
3,3-Dichlorobenzidine	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Benzo(a)Anthracene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Chrysene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
bis(2-Ethylhexyl)Phthal	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
di-n-Octylphthalate	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Benzo(b)Fluoranthene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Benzo(k)Fluoranthene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Benzo(a)Pyrene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Indeno(1,2,3-cd)Pyrene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Dibenz(a,h)Anthracene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV
Benzo(g,h,i)Perylene	0.220	U	mg/Kg	EPA 8270	09/17 10/26	GV

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected. Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-1
Client Sample ID :LAY-~~A0C5~~-SD01 POINT LAY
Matrix :SOIL SS08

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70058
Report Completed :10/08/93
Collected :08/23/93 @ 13:30 hrs
Received :08/25/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Qualifier/Comments

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.250	U	mg/Kg	EPA 8260 (J) - L. 1		08/26	09/05	MCM
Bromobenzene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromochloromethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromodichloromethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromoform	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromomethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
n-Butylbenzene	3.66	D	mg/Kg	EPA 8260		08/26	09/05	MCM
sec-Butylbenzene	1.51	D	mg/Kg	EPA 8260		08/26	09/05	MCM
tert-Butylbenzne	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Carbon Tetrachloride	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chlorobenzene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroform	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloromethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2-Chlorotoluene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
4-Chlorotoluene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromochloromethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
12Dibromo3Chloropropane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dibromoethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromomethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichlorobenzene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichlorobenzene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,4-Dichlorobenzene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dichlorodifluoromethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloroethane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
cis-1,2-Dichloroethene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
trans1,2-Dichloroethene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloropropane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichloropropane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2,2-Dichloropropane	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloropropene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Ethylbenzene	2.30	D	mg/Kg	EPA 8260		08/26	09/05	MCM
Hexachlorobutadiene	0.250	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Isopropylbenzene	1.34	D	mg/Kg	EPA 8260		08/26	09/05	MCM
p-Isopropyltoluene	1.45	D	mg/Kg	EPA 8260		08/26	09/05	MCM

OP
2-3-94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

5633 B STR[illegible]
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS Scc

Chemlab Ref.# :93.4327-1
Client Sample ID :LAY-~~AOC5~~-SD01 POINT LAY
Matrix :SOIL SSØ8

Bradeyai / Cammanb

Methylene Chloride	0.250	U	mg/Kg	EPA 8260 (J) -L.1	08/26	09/05	MCM
Napthalene	8.10	D	mg/Kg	EPA 8260	08/26	09/05	MCM
n-Propylbenzene	2.81	D	mg/Kg	EPA 8260	08/26	09/05	MCM
Styrene	0.250	U	mg/Kg	EPA 8260	08/26	09/05	MCM
1112-Tetrachloroethane	0.250	U	mg/Kg	EPA 8260	08/26	09/05	MCM
1122-Tetrachloroethane	0.250	U	mg/Kg	EPA 8260	08/26	09/05	MCM
Tetrachloroethene	0.250	U	mg/Kg	EPA 8260	08/26	09/05	MCM
Toluene	2.11	D	mg/Kg	EPA 8260	08/26	09/05	MCM
1,2,3-Trichlorobenzene	0.250	U	mg/Kg	EPA 8260	08/26	09/05	MCM
1,2,4-Trichlorobenzene	0.250	U	mg/Kg	EPA 8260	08/26	09/05	MCM
1,1,1-Trichloroethane	0.250	U	mg/Kg	EPA 8260	08/26	09/05	MCM
1,1,2-Trichloroethane	0.250	U	mg/Kg	EPA 8260	08/26	09/05	MCM
Trichloroethene	0.250	U	mg/Kg	EPA 8260	08/26	09/05	MCM
Trichlorofluoromethane	0.250	U	mg/Kg	EPA 8260	08/26	09/05	MCM
1,2,3-Trichloropropane	0.250	U	mg/Kg	EPA 8260	08/26	09/05	MCM
1,2,4-Trimethylbenzene	13.9	D	mg/Kg	EPA 8260	08/26	09/05	MCM
1,3,5-Trimethylbenzene	5.31	D	mg/Kg	EPA 8260	08/26	09/05	MCM
Vinyl Chloride	0.250	U	mg/Kg	EPA 8260	08/26	09/05	MCM
p+m-Xylene	9.87	D	mg/Kg	EPA 8260	08/26	09/05	MCM
o-Xylene	5.00	D	mg/Kg	EPA 8260	08/26	09/05	MCM
Semivolatile Organics				EPA 8270			
Phenol	0.240	U	mg/Kg	EPA 8270	09/06	09/29	[illegible]
bis(2-Chloroethyl)ether	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
2-Chlorophenol	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
1,3-Dichlorobenzene	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
1,4-Dichlorobenzene	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Benzyl Alcohol	0.680		mg/Kg	EPA 8270	09/06	09/29	MTT
1,2-Dichlorobenzene	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
2-Methylphenol	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
bis(2-Chloroisopropyl)e	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
4-Methylphenol	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
n-Nitroso-di-n-Propylam	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Hexachloroethane	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Nitrobenzene	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Isophorone	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
2-Nitrophenol	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
2,4-Dimethylphenol	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Benzoic Acid	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
bis(2-Chloroethoxy)Meth	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
2,4-Dichlorophenol	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
1,2,4-Trichlorobenzene	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Naphthalene	2.02		mg/Kg	EPA 8270	09/06	09/29	MTT
4-Chloroaniline	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
Hexachlorobutadiene	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
4-Chloro-3-Methylphenol	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
2-Methylnaphthalene	2.43		mg/Kg	EPA 8270	09/06	09/29	MTT
Hexachlorocyclopentadie	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
2,4,6-Trichlorophenol	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
2,4,5-Trichlorophenol	0.240	U	mg/Kg	EPA 8270	09/06	09/29	MTT
2-Chloronaphthalene	0.240	U	mg/Kg	EPA 8270	09/06	09/29	[illegible]

CD 2-3-94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS SCE

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-1
Client Sample ID :LAY-~~AOC5~~-SD01 POINT LAY
Matrix :SOIL SS08

				Qualifier	Comment			
2-Nitroaniline	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Dimethylphthalate	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Acenaphthylene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
2,6-Dinitrotoluene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
3-Nitroaniline	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Acenaphthene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
2,4-Dinitrophenol	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
4-Nitrophenol	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Dibenzofuran	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
2,4-Dinitrotoluene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Diethylphthalate	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
4-Chlorophenyl-Phenylet	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Fluorene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
4-Nitroaniline	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
4,6-Dinitro-2-Methylphe	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
n-Nitrosodiphenylamine	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
4-Bromophenyl-Phenyleth	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Hexachlorobenzene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Pentachlorophenol	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Phenanthrene	0.661		mg/Kg			EPA 8270	09/06 09/29	MTT
Anthracene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
di-n-Butylphthalate	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Fluoranthene	0.261		mg/Kg			EPA 8270	09/06 09/29	MTT
Pyrene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Butylbenzylphthalate	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
3,3-Dichlorobenzidine	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Benzo(a)Anthracene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Chrysene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
bis(2-Ethylhexyl)Phthal	0.441 ~~1.00~~	U	mg/Kg			EPA 8270	09/06 09/29	MTT
di-n-Octylphthalate	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Benzo(b)Fluoranthene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Benzo(k)Fluoranthene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Benzo(a)Pyrene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Indeno(1,2,3-cd)Pyrene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Dibenz(a,h)Anthracene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT
Benzo(g,h,i)Perylene	0.240	U	mg/Kg			EPA 8270	09/06 09/29	MTT

Original by: [illegible] 2-2-94

Sample Preparation	---					EPA 3050 Digest		
Total Metals Analysis	---					-		
ICP Screen, ICF						EPA	n/a	
Aluminum	1700		mg/Kg			EPA 6010	08/31 09/02	DLG
Antimony	56	U	mg/Kg	J	5.2	EPA 6010	08/31 09/02	DLG
Arsenic	56	U	mg/Kg			EPA 6010	08/31 09/02	DLG
Barium	330		mg/Kg			EPA 6010	08/31 09/02	DLG
Beryllium	2.8	U	mg/Kg			EPA 6010	08/31 09/02	DLG
Cadmium	2.8	U	mg/Kg			EPA 6010	08/31 09/02	DLG
Calcium	1200		mg/Kg			EPA 6010	08/31 09/02	DLG
Chromium	4.7		mg/Kg			EPA 6010	08/31 09/02	DLG
Cobalt	5.6	U	mg/Kg			EPA 6010	08/31 09/02	DLG
Copper	7.1		mg/Kg			EPA 6010	08/31 09/02	DLG
Iron	21000		mg/Kg			EPA 6010	08/31 09/02	DLG

All changes s.c 2/2/94

Compiled: [illegible] 1/29/94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-1
Client Sample ID :LAY-~~AOC5~~-SD01 POINT LAY
Matrix :SOIL SS08

		Qualifier		Comment				
Lead	5.6 U		mg/Kg		EPA 6010	08/31	09/02	DLG
Magnesium	920		mg/Kg		EPA 6010	08/31	09/02	DLG
Manganese	200	J	mg/Kg	J.2	EPA 6010	08/31	09/02	DLG
Molybdenum	2.8 U		mg/Kg		EPA 6010	08/31	09/02	DLG
Nickel	13		mg/Kg		EPA 6010	08/31	09/02	DLG
Potassium	420		mg/Kg		EPA 6010	08/31	09/06	DLG
Selenium	56 U	~~X~~	mg/Kg	~~J.2~~	EPA 6010	08/31	09/06	DLG
Silver	28 U	R	mg/Kg	J.1	EPA 6010	08/31	09/06	DLG
Sodium	87		mg/Kg		EPA 6010	08/31	09/06	DLG
Thallium	0.29 U		mg/Kg		EPA 7841	08/30	09/01	KAW
Vanadium	13		mg/Kg		EPA 6010	08/31	09/02	DLG
Zinc	44		mg/Kg		EPA 6010	08/31	09/02	DLG

All changes
2/2/94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-6
Client Sample ID :LAY-~~AOC5~~-SW01 POINT LAY
SS08
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70116
Report Completed :10/06/93
Collected :08/24/93 @ 11:00 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0070		mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Ethylbenzene	0.0065		mg/L	EPA 8260		09/02	09/02	MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Isopropylbenzene	0.0012		mg/L	EPA 8260		09/02	09/02	MCM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4356-6
Client Sample ID :LAY-~~AOC~~5-SW01 POINT LAY
Matrix :WATER SS08

Methylene Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Napthalene	0.015		mg/L	EPA 8260	09/02	09/02	MCM
n-Propylbenzene	0.0013		mg/L	EPA 8260	09/02	09/02	MCM
Styrene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Toluene	0.030		mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Trichloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trimethylbenzene	0.014		mg/L	EPA 8260	09/02	09/02	MCM
1,3,5-Trimethylbenzene	0.011		mg/L	EPA 8260	09/02	09/02	MCM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
p+m-Xylene	0.036		mg/L	EPA 8260	09/02	09/02	MCM
o-Xylene	0.030		mg/L	EPA 8260	09/02	09/02	MCM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-1
Client Sample ID :LAY-~~AOC5~~ SS08-SW01 POINT LAY
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70106
Report Completed :10/07/93
Collected :08/24/93 @ 11:00 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By : Steph C Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

Qualifier/Comments

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics				EPA 8270				
Phenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Chloroethyl)ether	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Chlorophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
1,3-Dichlorobenzene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
1,4-Dichlorobenzene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzyl Alcohol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
1,2-Dichlorobenzene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Methylphenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Chloroisopropyl)e	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Methylphenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
n-Nitroso-di-n-Propylam	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Hexachloroethane	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Nitrobenzene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Isophorone	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Nitrophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dimethylphenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzoic Acid	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Chloroethoxy)Meth	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dichlorophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
1,2,4-Trichlorobenzene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Naphthalene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Chloroaniline	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Hexachlorobutadiene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Chloro-3-Methylphenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Methylnaphthalene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Hexachlorocyclopentadie	0.017	U	mg/L	EPA 8270	(J)-D.I	08/30	09/06	MTT
2,4,6-Trichlorophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4,5-Trichlorophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Chloronaphthalene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Nitroaniline	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Dimethylphthalate	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Acenaphthylene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2,6-Dinitrotoluene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
3-Nitroaniline	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Acenaphthene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dinitrophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Nitrophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT

CCP
2-1-94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B ST
ANCHORAGE, AK
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-1
Client Sample ID :LAY-~~AOC5~~-SW01 POINT LAY
Matrix :WATER SS08

Qualifier/Comments

Dibenzofuran	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dinitrotoluene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Diethylphthalate	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Chlorophenyl-Phenylet	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Fluorene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Nitroaniline	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4,6-Dinitro-2-Methylphe	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
n-Nitrosodiphenylamine	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Bromophenyl-Phenyleth	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Hexachlorobenzene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Pentachlorophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Phenanthrene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Anthracene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
di-n-Butylphthalate	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Fluoranthene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Pyrene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Butylbenzylphthalate	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
3,3-Dichlorobenzidine	0.017	U	mg/L	EPA 8270	(J)-D.1	08/30	09/06	MTT
Benzo(a)Anthracene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Chrysene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Ethylhexyl)Phthal	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
di-n-Octylphthalate	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(b)Fluoranthene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(k)Fluoranthene	0.017	U	mg/L	EPA 8270		08/30	09/06	TT
Benzo(a)Pyrene	0.017	U	mg/L	EPA 8270		08/30	09/06	T
Indeno(1,2,3-cd)Pyrene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Dibenz(a,h)Anthracene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(g,h,i)Perylene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.12		mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.33		mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Calcium	57		mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Iron	6.3		mg/L	EPA 6010		09/02	09/06	DLG
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Magnesium	29		mg/L	EPA 6010		09/02	09/06	DLG
Manganese	0.61		mg/L	EPA 6010		09/02	09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Potassium	5.4		mg/L	EPA 6010		09/15	09/17	DFL
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Sodium	28		mg/L	EPA 6010		09/15	09/17	DFL

08
2-1-94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-1
Client Sample ID :LAY-~~A0C5~~-SW01 POINT LAY
Matrix :WATER S608

Qualifier Comment

Thallium	0.005	U		mg/L	EPA 7841		09/03	09/08	BMW
Vanadium	0.050	U		mg/L	EPA 6010		09/02	09/06	DLG
Zinc	0.050	U		mg/L	EPA 6010		09/15	09/17	DFL
Dissolved Metals Analys	---				-				
ICP Screen, ICF					EPA	n/a			
Aluminum	0.10	U		mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U		mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U		mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.27			mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U		mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U		mg/L	EPA 6010		09/02	09/06	DLG
Calcium	57			mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.050	U		mg/L	EPA 6010		09/02	09/06	DLG
Cobalt	0.10	U		mg/L	EPA 6010		09/02	09/06	DLG
Copper	0.050	U		mg/L	EPA 6010		09/02	09/06	DLG
Iron	0.10	U		mg/L	EPA 6010		09/02	09/06	DLG
Lead	0.10	U		mg/L	EPA 6010		09/02	09/06	DLG
Magnesium	28			mg/L	EPA 6010		09/02	09/06	DLG
Manganese	0.54			mg/L	EPA 6010		09/02	09/06	DLG
Molybdenum	0.050	U		mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.050	U		mg/L	EPA 6010		09/02	09/06	DLG
Potassium	6.1			mg/L	EPA 6010		09/15	09/17	DFL
Selenium	0.10	U		mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.050	U	J	mg/L J.2	EPA 6010		09/02	09/06	DLG
Sodium	29			mg/L	EPA 6010		09/15	09/17	DFL
Thallium	0.005	U		mg/L	EPA 7841		09/03	09/08	BMW
Vanadium	0.050	U		mg/L	EPA 6010		09/02	09/06	DLG
Zinc	0.050	U		mg/L	EPA 6010		09/15	09/17	DFL
TOC, Nonpurgable					EPA 9060	n/a			
...TOC Range	19.1-20.1			mg/L	EPA 9060			09/07	CMR
...TOC Concentration	19.6			mg/L	EPA 9060			09/07	CMR
Residue, Non-Filterable	23.5 ~~2.4~~ G			mg/L	EPA 160.2		08/30	08/31	GPP
Residue,Filterable(TDS)	596		J	mg/L A.1	EPA 160.1	500	09/01	09/02	RJK

original: D.L. 1/31/94

All changes s.c 2/2/94

Compiled: SMF 11/29/94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-3
Client Sample ID :LAY-~~AOC5~~-SW01 POINT LAY DUPLICATE
Matrix :WATER SS08 dup 12.695

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70106
Ordered By	:RAY MORRIS	Report Completed	:10/07/93
Project Name	:DEW LINE RI/FS	Collected	:08/24/93 @ 11:00 hrs.
Project#	:41096-412-01	Received	:08/26/93 @ 12:00 hrs.
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	:

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. METALS: SEE 9/17 RUN FOR DUP OF NA, K, ZN. (93.4328-5)

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Total Metals Analysis	---			-				
ICP Screen, ICP				EPA	n/a			
Aluminum	0.11		mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.33		mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Calcium	59		mg/L	EPA 6010		09/02	09/06	[illegible]
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	[illegible]
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Iron	6.5		mg/L	EPA 6010		09/02	09/06	DLG
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Magnesium	28		mg/L	EPA 6010		09/02	09/06	DLG
Manganese	0.62		mg/L	EPA 6010		09/02	09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Potassium	---		mg/L	EPA 6010				
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Sodium	---		mg/L	EPA 6010				
Thallium	0.005	U	mg/L	EPA 7841		09/03	09/08	BMW
Vanadium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Zinc	---		mg/L	EPA 6010				
Dissolved Metals Analys	---			-				
ICP Screen, ICP				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.28		mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Calcium	58		mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-3
Client Sample ID :LAY-~~AOC5~~-SW01 POINT LAY DUPLICATE SS08 BWD 12695
Matrix :WATER

Copper	0.050	U	mg/L	EPA 6010	09/02	09/06	DL
Iron	0.10	U	mg/L	EPA 6010	09/02	09/06	DL
Lead	0.10	U	mg/L	EPA 6010	09/02	09/06	DL
Magnesium	29		mg/L	EPA 6010	09/02	09/06	DL
Manganese	0.55		mg/L	EPA 6010	09/02	09/06	DL
Molybdenum	0.050	U	mg/L	EPA 6010	09/02	09/06	DL
Nickel	0.050	U	mg/L	EPA 6010	09/02	09/06	DL
Potassium	---		mg/L	EPA 6010			
Selenium	0.10	U	mg/L	EPA 6010	09/02	09/06	DL
Silver	0.050	U	mg/L	EPA 6010	09/02	09/06	DL
Sodium	---		mg/L	EPA 6010			
Thallium	0.005	U	mg/L	EPA 7841	09/03	09/08	BM
Vanadium	0.050	U	mg/L	EPA 6010	09/02	09/06	DL
Zinc	---		mg/L	EPA 6010			

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-2
Client Sample ID :LAY-~~AOC3~~-SW01 POINT LAY SPIKE
Matrix :WATER SS08
SWL
12.695

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70106
Ordered By	:RAY MORRIS	Report Completed	:10/07/93
Project Name	:DEW LINE RI/FS	Collected	:08/24/93 @ 11:00 hrs
Project#	:41096-412-01	Received	:08/26/93 @ 12:00 hrs
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	: C. Vanstewart

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. METALS: SEE 93.4328-5 FOR/SPIKE FOR NA, K, ZN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics				EPA 8270				
Phenol	0.092		mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Chloroethyl)ether	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Chlorophenol	0.133		mg/L	EPA 8270		08/30	09/06	MTT
1,3-Dichlorobenzene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
1,4-Dichlorobenzene	0.107		mg/L	EPA 8270		08/30	09/06	MTT
Benzyl Alcohol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
1,2-Dichlorobenzene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Methylphenol	0.017	U	mg/L	EPA 8270		08/30	09/06	[illegible]
bis(2-Chloroisopropyl)e	0.017	U	mg/L	EPA 8270		08/30	09/06	[illegible]
4-Methylphenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
n-Nitroso-di-n-Propylam	0.148		mg/L	EPA 8270		08/30	09/06	MTT
Hexachloroethane	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Nitrobenzene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Isophorone	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Nitrophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dimethylphenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzoic Acid	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Chloroethoxy)Meth	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dichlorophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
1,2,4-Trichlorobenzene	0.122		mg/L	EPA 8270		08/30	09/06	MTT
Naphthalene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Chloroaniline	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Hexachlorobutadiene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Chloro-3-Methylphenol	0.159		mg/L	EPA 8270		08/30	09/06	MTT
2-Methylnaphthalene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Hexachlorocyclopentadie	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4,6-Trichlorophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4,5-Trichlorophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Chloronaphthalene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Nitroaniline	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Dimethylphthalate	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Acenaphthylene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2,6-Dinitrotoluene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
3-Nitroaniline	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Acenaphthene	0.154		mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dinitrophenol	0.017	U	mg/L	EPA 8270		08/30	09/06	[illegible]

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-2
Client Sample ID :LAY-~~A0C5~~-SW01 POINT LAY SPIKE
Matrix :WATER SS08
surf 12695

4-Nitrophenol	0.080		mg/L	EPA 8270		08/30	09/06	MTT
Dibenzofuran	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dinitrotoluene	0.154		mg/L	EPA 8270		08/30	09/06	MTT
Diethylphthalate	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Chlorophenyl-Phenylet	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Fluorene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Nitroaniline	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4,6-Dinitro-2-Methylphe	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
n-Nitrosodiphenylamine	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Bromophenyl-Phenyleth	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Hexachlorobenzene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Pentachlorophenol	0.063		mg/L	EPA 8270		08/30	09/06	MTT
Phenanthrene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Anthracene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
di-n-Butylphthalate	0.088		mg/L	EPA 8270		08/30	09/06	MTT
Fluoranthene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Pyrene	0.169		mg/L	EPA 8270		08/30	09/06	MTT
Butylbenzylphthalate	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
3,3-Dichlorobenzidine	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(a)Anthracene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Chrysene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Ethylhexyl)Phthal	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
di-n-Octylphthalate	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(b)Fluoranthene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(k)Fluoranthene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(a)Pyrene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Indeno(1,2,3-cd)Pyrene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Dibenz(a,h)Anthracene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(g,h,i)Perylene	0.017	U	mg/L	EPA 8270		08/30	09/06	MTT
Total Metals Analysis	---			-				
ICP Screen, ICP				EPA	n/a			
Aluminum	1.14		mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.87		mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.91		mg/L	EPA 6010		09/02	09/06	DLG
Barium	1.32		mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.39		mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.47		mg/L	EPA 6010		09/02	09/06	DLG
Calcium	67		mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.97		mg/L	EPA 6010		09/02	09/06	DLG
Cobalt	0.93		mg/L	EPA 6010		09/02	09/06	DLG
Copper	0.95		mg/L	EPA 6010		09/02	09/06	DLG
Iron	7.3		mg/L	EPA 6010		09/02	09/06	DLG
Lead	0.89		mg/L	EPA 6010		09/02	09/06	DLG
Magnesium	39		mg/L	EPA 6010		09/02	09/06	DLG
Manganese	1.59		mg/L	EPA 6010		09/02	09/06	DLG
Molybdenum	0.97		mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.95		mg/L	EPA 6010		09/02	09/06	DLG
Potassium	---		mg/L	EPA 6010				
Selenium	0.90		mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.15		mg/L	EPA 6010		09/02	09/06	DLG

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4354-2
Client Sample ID :LAY-~~AOC5~~-SW01 POINT LAY SPIKE
Matrix :WATER SS08
8ML
12.695

Sodium	---	mg/L	EPA 6010			
Thallium	0.016	mg/L	EPA 7841		09/03 09/08	BMW
Vanadium	0.94	mg/L	EPA 6010		09/02 09/06	DLG
Zinc	---	mg/L	EPA 6010			
Dissolved Metals Analys	---		-			
ICP Screen, ICP			EPA	n/a		
Aluminum	1.08	mg/L	EPA 6010		09/02 09/06	DLG
Antimony	0.89	mg/L	EPA 6010		09/02 09/06	DLG
Arsenic	0.93	mg/L	EPA 6010		09/02 09/06	DLG
Barium	1.27	mg/L	EPA 6010		09/02 09/06	DLG
Beryllium	0.39	mg/L	EPA 6010		09/02 09/06	DLG
Cadmium	0.48	mg/L	EPA 6010		09/02 09/06	DLG
Calcium	67	mg/L	EPA 6010		09/02 09/06	DLG
Chromium	0.98	mg/L	EPA 6010		09/02 09/06	DLG
Cobalt	0.96	mg/L	EPA 6010		09/02 09/06	DLG
Copper	0.97	mg/L	EPA 6010		09/02 09/06	DLG
Iron	1.04	mg/L	EPA 6010		09/02 09/06	DLG
Lead	0.92	mg/L	EPA 6010		09/02 09/06	DLG
Magnesium	38	mg/L	EPA 6010		09/02 09/06	DLG
Manganese	1.55	mg/L	EPA 6010		09/02 09/06	DLG
Molybdenum	0.98	mg/L	EPA 6010		09/02 09/06	DLG
Nickel	0.96	mg/L	EPA 6010		09/02 09/06	DLG
Potassium	---	mg/L	EPA 6010			
Selenium	0.90	mg/L	EPA 6010		09/02 09/06	DLG
Silver	0.091	mg/L	EPA 6010		09/02 09/06	DLG
Sodium	---	mg/L	EPA 6010			
Thallium	0.016	mg/L	EPA 7841		09/03 09/08	BMW
Vanadium	0.95	mg/L	EPA 6010		09/02 09/06	DLG
Zinc	---	mg/L	EPA 6010			

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-11
Client Sample ID :LAY-~~AOCS~~-SW01 POINT LAY SPIKE DUPLICATE
Matrix :WATER SS08 SMF 12-6-95

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70106
Report Completed :10/07/93
Collected :08/24/93 @ 11:00 hrs
Received :08/26/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics				EPA 8270				
Phenol	0.108		mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Chloroethyl)ether	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Chlorophenol	0.154		mg/L	EPA 8270		08/30	09/06	MTT
1,3-Dichlorobenzene	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
1,4-Dichlorobenzene	0.103		mg/L	EPA 8270		08/30	09/06	MTT
Benzyl Alcohol	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
1,2-Dichlorobenzene	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Methylphenol	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Chloroisopropyl)e	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Methylphenol	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
n-Nitroso-di-n-Propylam	0.160		mg/L	EPA 8270		08/30	09/06	MTT
Hexachloroethane	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
Nitrobenzene	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
Isophorone	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Nitrophenol	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dimethylphenol	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzoic Acid	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Chloroethoxy)Meth	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dichlorophenol	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
1,2,4-Trichlorobenzene	0.122		mg/L	EPA 8270		08/30	09/06	MTT
Naphthalene	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Chloroaniline	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
Hexachlorobutadiene	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Chloro-3-Methylphenol	0.188		mg/L	EPA 8270		08/30	09/06	MTT
2-Methylnaphthalene	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
Hexachlorocyclopentadie	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4,6-Trichlorophenol	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4,5-Trichlorophenol	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Chloronaphthalene	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Nitroaniline	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
Dimethylphthalate	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
Acenaphthylene	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
2,6-Dinitrotoluene	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
3-Nitroaniline	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
Acenaphthene	0.169		mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dinitrophenol	0.019	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Nitrophenol	0.107		mg/L	EPA 8270		08/30	09/06	MTT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B S[illegible]T
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-11
Client Sample ID :LAY-~~AOC5~~-SW01 POINT LAY SPIKE DUPLICATE
Matrix :WATER SS28 SMP 12695

Dibenzofuran	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
2,4-Dinitrotoluene	0.186		mg/L	EPA 8270	08/30	09/06	MTT
Diethylphthalate	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
4-Chlorophenyl-Phenylet	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Fluorene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
4-Nitroaniline	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
4,6-Dinitro-2-Methylphe	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
n-Nitrosodiphenylamine	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
4-Bromophenyl-Phenyleth	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Hexachlorobenzene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Pentachlorophenol	0.079		mg/L	EPA 8270	08/30	09/06	MTT
Phenanthrene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Anthracene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
di-n-Butylphthalate	0.113		mg/L	EPA 8270	08/30	09/06	MTT
Fluoranthene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Pyrene	0.183		mg/L	EPA 8270	08/30	09/06	MTT
Butylbenzylphthalate	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
3,3-Dichlorobenzidine	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Benzo(a)Anthracene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Chrysene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
bis(2-Ethylhexyl)Phthal	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
di-n-Octylphthalate	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Benzo(b)Fluoranthene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Benzo(k)Fluoranthene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Benzo(a)Pyrene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Indeno(1,2,3-cd)Pyrene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Dibenz(a,h)Anthracene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT
Benzo(g,h,i)Perylene	0.019	U	mg/L	EPA 8270	08/30	09/06	MTT

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

ICF ID	LAY-~~AOC5~~ SS08-S01	LAY-~~AOC5~~ SS08-S02	LAY-~~AOC5~~ SS08-S03	LAY-~~AOC5~~ SS08-S04
F&BI Number	417	419	421	423
Sample Type	soil	soil	soil	soil
Date Received	8/24/93	8/24/93	8/24/93	8/24/93
% Dry Weight	93	97	96	89
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93
Leaded Gas				
JP-4	<50	<50	<50	<50
Lube Oil	<100	<100	<100	<100
Diesel	~~5400~~ 7200	<50	<50	<50
Spike Level				
Unknown Semi-volatile				
Pentacosane	99	120	79	111
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93
PCB 1221	<0.1	<0.1	<0.1	<0.1
PCB 1232	<0.1	<0.1	<0.1	<0.1
PCB 1016	<0.1	<0.1	<0.1	<0.1
PCB 1242	<0.1	<0.1	<0.1	<0.1
PCB 1248	<0.1	<0.1	<0.1	<0.1
PCB 1254	<0.1	<0.1	<0.1	<0.1
PCB 1260	<0.1	<0.1	<0.1	<0.1
Spike Level				
Dibutyl Chlorendate	88	90	89	80
Sequence Date	#5-08/24/93			
alpha-BHC	<0.02 J			
beta-BHC	<0.02 J			
gamma-BHC	<0.02 J			
delta-BHC	<0.02 J			
Heptachlor	<0.02 J			
Aldrin	<0.02 J			
Heptachlor Epoxide	<0.02 J			
Endosulfan I	<0.02 J			
DDE	<0.02 J			
Dieldrin	<0.02 J			
Endrin	<0.02 J			
Endosulfan II	<0.02 J			
DDD	<0.02 J			
Endrin Aldehyde	<0.02 J			
DDT	<0.02 J			
Endosulfan Sulfate	<0.02 J			
Endrin Ketone	<0.02 J			
Methoxy Chlor	~~<0.1~~ <0.5 J			
Chlordane	<0.5 J			
Dibutyl Chlorendate	88			
Spike Level				
Vol Sequence	#1&2-08/24/93	#3&4-08/27/93	#3&4-08/27/93	#3&4-08/27/93
CCl4	<0.02	<0.02	<0.02	<0.02
TCA	<0.02	<0.02	<0.02	<0.02
Benzene	0.26 R	<0.02	<0.02	<0.02
TCE	<0.02	<0.02	<0.02	<0.02
Toluene	1.8 R	<0.02	<0.02	<0.02
PCE	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	12 R	<0.02	<0.02	<0.02
Xylenes	19 R	<0.04	<0.04	<0.04
Gasoline	550 diesel J	<2 J	<2 J	<2 J
Spike level				
BFB	100	104	136	110

SWP 6-19-95

RSB 6-14-95

Shef 6.19.95

ICF ID	SS08 LAY-~~AOC5~~-S05	SS08 LAY-~~AOC5~~-S06	SS08 LAY-~~AOC5~~-S06	SS08 LAY-~~AOC5~~-S06
F&BI Number	425	427	427 dup	427 ms
Sample Type	soil	soil	soil	soil
Date Received	8/24/93	8/24/93	8/24/93	8/24/93
% Dry Weight	93	85	87	
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93
Leaded Gas				
JP-4	<50	<50	<50	
Lube Oil	<100	<100	<100	
Diesel	<50	~~2200~~ 2900	1700	92
Spike Level				500
Unknown Semi-volatile				
Pentacosane	95	82	91	95
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93
PCB 1221	<0.1	<0.1	~~<0.5~~ <0.1	
PCB 1232	<0.1	<0.1	~~<0.5~~ <0.1	
PCB 1016	<0.1	<0.1	~~<0.5~~ <0.1	
PCB 1242	<0.1	<0.1	~~<0.5~~ <0.1	
PCB 1248	<0.1	<0.1	~~<0.5~~ <0.1	
PCB 1254	<0.1	<0.1	~~<0.5~~ <0.1	120
PCB 1260	<0.1	<0.1	~~<0.5~~ <0.1	
Spike Level				5
Dibutyl Chlorendate	91	93	103	120
Sequence Date				
alpha-BHC				
beta-BHC				
gamma-BHC				
delta-BHC				
Heptachlor				
Aldrin				
Heptachlor Epoxide				
Endosulfan I				
DDE				
Dieldrin				
Endrin				
Endosulfan II				
DDD				
Endrin Aldehyde				
DDT				
Endosulfan Sulfate				
Endrin Ketone				
Methoxy Chlor				
Chlordane				
Dibutyl Chlorendate				
Spike Level				
Vol Sequence	#3&4-08/27/93	#1&2-08/24/93	#1&2-08/24/93	#1&2-08/24/93
CCl4	<0.02	<0.02	<0.02	
TCA	<0.02	<0.02	<0.02	
Benzene	<0.02	1.4	0.8	102
TCE	<0.02	<0.02	<0.02	
Toluene	<0.02	2.8	2.2	
PCE	<0.02	<0.02	<0.02	
Ethylbenzene	<0.02	11 J	11	
Xylenes	<0.04	22 J	20	
Gasoline	<2 J	330 diesel J	16	
Spike level				1
BFB	120	106	102	102

RJB 6-14-95

SKE 6.19.95

ICF ID	SS08 LAY-~~AOC5~~-S06	SS08 LAY-~~AOC5~~-S07	SS08 LAY-~~AOC5~~-SD01	SS08 LAY-~~AOC5~~-SD02
F&BI Number	427 msd	429	463	465
Sample Type	soil	soil	soil	soil
Date Received	8/24/93	8/24/93	8/24/93	8/24/93
% Dry Weight		90	88	7
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/25/93	#5-08/25/93
Leaded Gas				
JP-4		<50	<60	<750
Lube Oil		<100	120	<1500
Diesel	101	~~5400~~ 7200	~~1500~~ 1100	~~2800~~ < 700
Spike Level	500			
Unknown Semi-volatile				
Pentacosane	110	92	100	102
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/25/93	#5-08/25/93
PCB 1221		<0.1	~~<0.5~~ <0.1	~~<10~~ <1.5
PCB 1232		<0.1	~~<0.5~~ <0.1	~~<10~~ <1.5
PCB 1016		<0.1	~~<0.5~~ <0.1	~~<10~~ <1.5
PCB 1242		<0.1	~~<0.5~~ <0.1	~~<10~~ <1.5
PCB 1248		<0.1	~~<0.5~~ <0.1	~~<10~~ <1.5
PCB 1254	120	<0.1	~~<0.5~~ <0.1	~~<10~~ <1.5
PCB 1260		<0.1	~~<0.5~~ <0.1	~~<10~~ <1.5
Spike Level	5			
Dibutyl Chlorendate	130	103	102	101
Sequence Date		#5-08/24/93		
alpha-BHC		<0.02 J		
beta-BHC		<0.02 J		
gamma-BHC		<0.02 J		
delta-BHC		<0.02 J		
Heptachlor		<0.02 J		
Aldrin		<0.02 J		
Heptachlor Epoxide		<0.02 J		
Endosulfan I		<0.02 J		
DDE		<0.02 J		
Dieldrin		<0.02 J		
Endrin		<0.02 J		
Endosulfan II		<0.02 J		
DDD		<0.02 J		
Endrin Aldehyde		<0.02 J		
DDT		<0.02 J		
Endosulfan Sulfate		<0.02 J		
Endrin Ketone		<0.02 J		
Methoxy Chlor		~~<0.1~~ <0.5 J		
Chlordane		<0.5 J		
Dibutyl Chlorendate		103		
Spike Level				
Vol Sequence	#1&2-08/24/93	#1&2-08/24/93	#1&2-08/24/93	#1&2-08/24/93
CCl4		<0.02	<0.02 J	<0.29
TCA		<0.02	<0.02 J	<0.29
Benzene		<0.02	0.23 J	<0.29
TCE		<0.02	<0.02 J	<0.29
Toluene		1.7 R	1	~~3.4~~ <0.29
PCE		<0.02	<0.02 J	<0.29
Ethylbenzene		14 R	1.9	~~7.8~~ <0.29
Xylenes		34 R	7.7 J	~~28~~ < 0.57
Gasoline		470 diesel J	46 J	~~48~~ < 2 J
Spike level	1			
BFB	103	98	117	112

RJB 6-14-95

[illegible] 6-14-95

ICF ID	SS08 LAY-~~AOC5~~-SD03	SS08 LAY-~~AOC5~~-SW01	SS08 LAY-~~AOC5~~-SW01
F&BI Number	467	573	576
Sample Type	soil	water	water
Date Received	8/24/93	8/25/93	8/25/93
% Dry Weight	26		
Sequence Date	#5-08/25/93	#5-08/27/93	
Leaded Gas			
JP-4	<200	<1000	
Lube Oil	<400	<2000	
Diesel	<200	<1000	
Spike Level			
Unknown Semi-volatile			
Pentacosane	97	60	
Sequence Date	#5-08/25/93	#5-08/27/93	
PCB 1221	~~<2~~ <0.4	<2	
PCB 1232	~~<2~~ <0.4	<2	
PCB 1016	~~<2~~ <0.4	<2	
PCB 1242	~~<2~~ <0.4	<2	
PCB 1248	~~<2~~ <0.4	<2	
PCB 1254	~~<2~~ <0.4	<2	
PCB 1260	~~<2~~ <0.4	<2	
Spike Level			
Dibutyl Chlorendate	94	51	
Sequence Date			
alpha-BHC			
beta-BHC			
gamma-BHC			
delta-BHC			
Heptachlor			
Aldrin			
Heptachlor Epoxide			
Endosulfan I			
DDE			
Dieldrin			
Endrin			
Endosulfan II			
DDD			
Endrin Aldehyde			
DDT			
Endosulfan Sulfate			
Endrin Ketone			
Methoxy Chlor			
Chlordane			
Dibutyl Chlorendate			
Spike Level			
Vol Sequence	#3&4-08/27/93		#3&4-08/25/93
CCl4	<0.08		<1
TCA	<0.08		<1
Benzene	<0.08		~~<1~~ 15
TCE	<0.08		<1
Toluene	<0.08		43
PCE	<0.08		<1
Ethylbenzene	<0.08		~~<1~~ 12 J
Xylenes	<0.16		~~48~~ 82 J
Gasoline	<2 J		~~<50~~ <100 J
Spike level			
BFB	116		96

RJB 6-14-95

8KLf
6-19-95

ICF ID	LAY-~~AOC5~~ SS08-SW02	LAY-~~AOC5~~ SS08-SW02
F&BI Number	577	578
Sample Type	water	water
Date Received	8/25/93	8/25/93
% Dry Weight		
Sequence Date	#5-08/27/93	
Leaded Gas		
JP-4	<1000	
Lube Oil	<2000	
Diesel	<1000	
Spike Level		
Unknown Semi-volatile		
Pentacosane	116	
Sequence Date	#5-08/27/93	
PCB 1221	<2	
PCB 1232	<2	
PCB 1016	<2	
PCB 1242	<2	
PCB 1248	<2	
PCB 1254	<2	
PCB 1260	<2	
Spike Level		
Dibutyl Chlorendate	96	
Sequence Date		
alpha-BHC		
beta-BHC		
gamma-BHC		
delta-BHC		
Heptachlor		
Aldrin		
Heptachlor Epoxide		
Endosulfan I		
DDE		
Dieldrin		
Endrin		
Endosulfan II		
DDD		
Endrin Aldehyde		
DDT		
Endosulfan Sulfate		
Endrin Ketone		
Methoxy Chlor		
Chlordane		
Dibutyl Chlorendate		
Spike Level		
Vol Sequence		#3&4-08/25/93
CCl4		<1
TCA		<1
Benzene		<1
TCE		<1
Toluene		<1
PCE		<1
Ethylbenzene		<1
Xylenes		<2
Gasoline		~~<50~~ <100 J
Spike level		
BFB		92

RJB
6-14-95

ANALYTICAL DATA SHEETS FOR BACKGROUND (BKGD)

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-6
Client Sample ID :LAY-BKGD-S01 POINT LAY
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70058
Report Completed :10/08/93
Collected :08/23/93 @ 14:40 hrs
Received :08/25/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. THE HIGH DETECTION LIMIT FOR 8270 IS DUE TO THE FACT THAT THE SAMPLE FORMED A THICK SLUDGE WHEN CONCENTRATED DOWN TO 1.0 ML, IT NEEDED TO BE DILUTED.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics								
Benzene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromobenzene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromochloromethane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromodichloromethane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromoform	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromomethane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
n-Butylbenzene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
sec-Butylbenzene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
tert-Butylbenzne	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Carbon Tetrachloride	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chlorobenzene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroethane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroform	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloromethane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2-Chlorotoluene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
4-Chlorotoluene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromochloromethane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
12Dibromo3Chloropropane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dibromoethane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromomethane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichlorobenzene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichlorobenzene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,4-Dichlorobenzene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dichlorodifluoromethane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloroethane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
cis-1,2-Dichloroethene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
trans1,2-Dichloroethene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloropropane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichloropropane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2,2-Dichloropropane	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloropropene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Ethylbenzene	0.150	U	mg/Kg	EPA 8260		08/26	09/05	MCM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B S
ANCHORAGE, AK
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-6
Client Sample ID :LAY-BKGD-S01 POINT LAY
Matrix :SOIL

		Qualifier		Comment			
2,4,6-Trichlorophenol	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
2,4,5-Trichlorophenol	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
2-Chloronaphthalene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
2-Nitroaniline	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Dimethylphthalate	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Acenaphthylene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
2,6-Dinitrotoluene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
3-Nitroaniline	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Acenaphthene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
2,4-Dinitrophenol	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
4-Nitrophenol	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Dibenzofuran	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
2,4-Dinitrotoluene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Diethylphthalate	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
4-Chlorophenyl-Phenylet	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Fluorene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
4-Nitroaniline	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
4,6-Dinitro-2-Methylphe	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
n-Nitrosodiphenylamine	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
4-Bromophenyl-Phenyleth	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Hexachlorobenzene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Pentachlorophenol	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Phenanthrene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Anthracene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
di-n-Butylphthalate	10.0	U	mg/Kg		EPA 8270	09/06 09/30	
Fluoranthene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Pyrene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Butylbenzylphthalate	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
3,3-Dichlorobenzidine	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Benzo(a)Anthracene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Chrysene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
bis(2-Ethylhexyl)Phthal	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
di-n-Octylphthalate	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Benzo(b)Fluoranthene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Benzo(k)Fluoranthene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Benzo(a)Pyrene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Indeno(1,2,3-cd)Pyrene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Dibenz(a,h)Anthracene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Benzo(g,h,i)Perylene	10.0	U	mg/Kg		EPA 8270	09/06 09/30	MTT
Sample Preparation	---				EPA 3050 Digest		
Total Metals Analysis	---				-		
ICP Screen, ICF					EPA n/a		
Aluminum	23000		mg/Kg		EPA 6010	08/31 09/02	DLG
Antimony	115	U J	mg/Kg	J.2	EPA 6010	08/31 09/02	DLG
Arsenic	115	U	mg/Kg		EPA 6010	08/31 09/02	DLG
Barium	390		mg/Kg		EPA 6010	08/31 09/02	DLG
Beryllium	5.7	U	mg/Kg		EPA 6010	08/31 09/02	DLG
Cadmium	5.7	U	mg/Kg		EPA 6010	08/31 09/02	DLG
Calcium	2500		mg/Kg		EPA 6010	08/31 09/02	DLG
Chromium	37		mg/Kg		EPA 6010	08/31 09/02	DLG

All changes A.L 2/2/94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-6
Client Sample ID :LAY-BKGD-S01 POINT LAY
Matrix :SOIL

		Qualifier		Comment				
Cobalt	11	U	mg/Kg		EPA 6010	08/31	09/02	DLG
Copper	20		mg/Kg		EPA 6010	08/31	09/02	DLG
Iron	35000		mg/Kg		EPA 6010	08/31	09/02	DLG
Lead	20		mg/Kg		EPA 6010	08/31	09/02	DLG
Magnesium	4300	J	mg/Kg	J.1	EPA 6010	08/31	09/02	DLG
Manganese	97		mg/Kg		EPA 6010	08/31	09/02	DLG
Molybdenum	5.7	U	mg/Kg		EPA 6010	08/31	09/02	DLG
Nickel	26		mg/Kg		EPA 6010	08/31	09/02	DLG
Potassium	1500		mg/Kg		EPA 6010	08/31	09/06	DLG
Selenium	115	U J	mg/Kg	J.2 S.L	EPA 6010	08/31	09/02	DLG
Silver	57	U R	mg/Kg	J.1	EPA 6010	08/31	09/02	DLG
Sodium	170		mg/Kg		EPA 6010	08/31	09/02	DLG
Thallium	0.57	U	mg/Kg		EPA 7841	08/31	09/06	KAW
Vanadium	56		mg/Kg		EPA 6010	08/30	09/01	KAW
Zinc	46		mg/Kg		EPA 6010	08/31	09/02	DLG
TOC, Soil	69300		mg/Kg		PSEP Ref Lab			

All changes A.L 2/2/94

===
* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-7
Client Sample ID :LAY-BKGD-S02 POINT LAY
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70058
Report Completed :10/08/93
Collected :08/23/93 @ 15:10 hrs
Received :08/25/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : [signature]

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. THE HIGH DETECTION LIMIT FOR 8270 IS DUE TO THE FACT THAT THE SAMPLE FORMED A THICK SLUDGE WHEN CONCENTRATED DOWN TO 1.0 ML, IT NEEDED TO BE DILUTED.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromobenzene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromochloromethane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromodichloromethane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromoform	0.070	U	mg/Kg	EPA 8260		08/26	09/05	[illegible]
Bromomethane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	[illegible]
n-Butylbenzene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
sec-Butylbenzene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
tert-Butylbenzne	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Carbon Tetrachloride	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chlorobenzene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroethane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroform	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloromethane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2-Chlorotoluene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
4-Chlorotoluene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromochloromethane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
12Dibromo3Chloropropane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dibromoethane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromomethane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichlorobenzene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichlorobenzene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,4-Dichlorobenzene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dichlorodifluoromethane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloroethane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
cis-1,2-Dichloroethene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
transi,2-Dichloroethene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloropropane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichloropropane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2,2-Dichloropropane	0.070	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloropropene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	M
Ethylbenzene	0.070	U	mg/Kg	EPA 8260		08/26	09/05	M

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-7
Client Sample ID :LAY-BKGD-S02 POINT LAY
Matrix :SOIL

2,4,6-Trichlorophenol	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4,5-Trichlorophenol	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Chloronaphthalene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Nitroaniline	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Dimethylphthalate	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Acenaphthylene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,6-Dinitrotoluene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
3-Nitroaniline	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Acenaphthene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dinitrophenol	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Nitrophenol	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Dibenzofuran	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dinitrotoluene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Diethylphthalate	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chlorophenyl-Phenylet	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Fluorene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Nitroaniline	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4,6-Dinitro-2-Methylphe	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
n-Nitrosodiphenylamine	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Bromophenyl-Phenyleth	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorobenzene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Pentachlorophenol	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Phenanthrene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Anthracene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
di-n-Butylphthalate	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Fluoranthene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Pyrene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Butylbenzylphthalate	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
3,3-Dichlorobenzidine	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(a)Anthracene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Chrysene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Ethylhexyl)Phthal	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
di-n-Octylphthalate	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(b)Fluoranthene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(k)Fluoranthene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(a)Pyrene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Indeno(1,2,3-cd)Pyrene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Dibenz(a,h)Anthracene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(g,h,i)Perylene	15.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Sample Preparation	---			EPA 3050 Digest			
Total Metals Analysis	---						
ICP Screen, ICF				- EPA	n/a		
Aluminum	9700		mg/Kg	EPA 6010	08/31	09/02	DLG
Antimony	114	U	mg/Kg	EPA 6010	08/31	09/02	DLG
Arsenic	114	U	mg/Kg	EPA 6010	08/31	09/02	DLG
Barium	170		mg/Kg	EPA 6010	08/31	09/02	DLG
Beryllium	5.7	U	mg/Kg	EPA 6010	08/31	09/02	DLG
Cadmium	5.7	U	mg/Kg	EPA 6010	08/31	09/02	DLG
Calcium	2200		mg/Kg	EPA 6010	08/31	09/02	DLG
Chromium	16		mg/Kg	EPA 6010	08/31	09/02	DLG

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-8
Client Sample ID :LAY-BKGD-S03 POINT LAY
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70058
Report Completed :10/08/93
Collected :08/23/93 @ 16:20 hrs
Received :08/25/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. THE HIGH DETECTION LIMIT FOR 8270 IS DUE TO THE FACT THAT THE SAMPLE FORMED A THICK SLUDGE WHEN CONCENTRATED DOWN TO 1.0 ML, IT NEEDED TO BE DILUTED.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromobenzene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromochloromethane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromodichloromethane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromoform	0.040	U	mg/Kg	EPA 8260		08/26	09/05	[illegible]
Bromomethane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	[illegible]
n-Butylbenzene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
sec-Butylbenzene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
tert-Butylbenzne	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Carbon Tetrachloride	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chlorobenzene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroethane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroform	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloromethane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2-Chlorotoluene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
4-Chlorotoluene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromochloromethane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
12Dibromo3Chloropropane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dibromoethane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromomethane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichlorobenzene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichlorobenzene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,4-Dichlorobenzene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dichlorodifluoromethane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloroethane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
cis-1,2-Dichloroethene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
trans1,2-Dichloroethene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloropropane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichloropropane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2,2-Dichloropropane	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloropropene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Ethylbenzene	0.040	U	mg/Kg	EPA 8260		08/26	09/05	[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-8
Client Sample ID :LAY-BKGD-S03 POINT LAY
Matrix :SOIL

2,4,6-Trichlorophenol	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4,5-Trichlorophenol	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Chloronaphthalene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2-Nitroaniline	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Dimethylphthalate	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Acenaphthylene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,6-Dinitrotoluene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
3-Nitroaniline	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Acenaphthene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dinitrophenol	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Nitrophenol	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Dibenzofuran	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
2,4-Dinitrotoluene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Diethylphthalate	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Chlorophenyl-Phenylet	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Fluorene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Nitroaniline	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4,6-Dinitro-2-Methylphe	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
n-Nitrosodiphenylamine	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
4-Bromophenyl-Phenyleth	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Hexachlorobenzene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Pentachlorophenol	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Phenanthrene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Anthracene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
di-n-Butylphthalate	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Fluoranthene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Pyrene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Butylbenzylphthalate	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
3,3-Dichlorobenzidine	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(a)Anthracene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Chrysene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
bis(2-Ethylhexyl)Phthal	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
di-n-Octylphthalate	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(b)Fluoranthene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(k)Fluoranthene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(a)Pyrene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Indeno(1,2,3-cd)Pyrene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Dibenz(a,h)Anthracene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Benzo(g,h,i)Perylene	12.0	U	mg/Kg	EPA 8270	09/06	09/30	MTT
Sample Preparation	---			EPA 3050 Digest			
Total Metals Analysis	---			-			
ICP Screen, ICF				EPA	n/a		
Aluminum	17000		mg/Kg	EPA 6010	08/31	09/02	DLG
Antimony	79	U	mg/Kg	EPA 6010	08/31	09/02	DLG
Arsenic	79	U	mg/Kg	EPA 6010	08/31	09/02	DLG
Barium	260		mg/Kg	EPA 6010	08/31	09/02	DLG
Beryllium	4.0	U	mg/Kg	EPA 6010	08/31	09/02	DLG
Cadmium	4.0	U	mg/Kg	EPA 6010	08/31	09/02	DLG
Calcium	3000		mg/Kg	EPA 6010	08/31	09/02	DLG
Chromium	28		mg/Kg	EPA 6010	08/31	09/02	DLG

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-9
Client Sample ID :LAY-BKGD-S04 POINT LAY
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70058
Report Completed :10/08/93
Collected :08/23/93 @ 16:00 hrs.
Received :08/25/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. THE HIGH DETECTION LIMIT FOR 8270 IS DUE TO THE FACT THAT THE SAMPLE FORMED A THICK SLUDGE WHEN CONCENTRATED DOWN TO 1.0 ML, IT NEEDED TO BE DILUTED.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromobenzene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromochloromethane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromodichloromethane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromoform	0.030	U	mg/Kg	EPA 8260		08/26	09/05	[illegible]
Bromomethane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	[illegible]
n-Butylbenzene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
sec-Butylbenzene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
tert-Butylbenzne	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Carbon Tetrachloride	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chlorobenzene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroethane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroform	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloromethane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2-Chlorotoluene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
4-Chlorotoluene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromochloromethane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
12Dibromo3Chloropropane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dibromoethane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromomethane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichlorobenzene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichlorobenzene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,4-Dichlorobenzene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dichlorodifluoromethane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloroethane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
cis-1,2-Dichloroethene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
trans1,2-Dichloroethene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloropropane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichloropropane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2,2-Dichloropropane	0.030	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloropropene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	[illegible]
Ethylbenzene	0.030	U	mg/Kg	EPA 8260		08/26	09/05	[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-9
Client Sample ID :LAY-BKGD-S04 POINT LAY
Matrix :SOIL

2,4,6-Trichlorophenol	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
2,4,5-Trichlorophenol	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
2-Chloronaphthalene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
2-Nitroaniline	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Dimethylphthalate	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Acenaphthylene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
2,6-Dinitrotoluene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
3-Nitroaniline	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Acenaphthene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
2,4-Dinitrophenol	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
4-Nitrophenol	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Dibenzofuran	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
2,4-Dinitrotoluene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Diethylphthalate	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
4-Chlorophenyl-Phenylet	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Fluorene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
4-Nitroaniline	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
4,6-Dinitro-2-Methylphe	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
n-Nitrosodiphenylamine	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
4-Bromophenyl-Phenyleth	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Hexachlorobenzene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Pentachlorophenol	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Phenanthrene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Anthracene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
di-n-Butylphthalate	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Fluoranthene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Pyrene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Butylbenzylphthalate	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
3,3-Dichlorobenzidine	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Benzo(a)Anthracene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Chrysene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
bis(2-Ethylhexyl)Phthal	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
di-n-Octylphthalate	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Benzo(b)Fluoranthene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Benzo(k)Fluoranthene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Benzo(a)Pyrene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Indeno(1,2,3-cd)Pyrene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Dibenz(a,h)Anthracene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Benzo(g,h,i)Perylene	6.90	U	mg/Kg	EPA 8270		09/06	09/30	MTT
Sample Preparation	---			EPA 3050 Digest				
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	19000		mg/Kg	EPA 6010		08/31	09/02	DLG
Antimony	66	U	mg/Kg	EPA 6010		08/31	09/02	DLG
Arsenic	66	U	mg/Kg	EPA 6010		08/31	09/02	DLG
Barium	290		mg/Kg	EPA 6010		08/31	09/02	DLG
Beryllium	4.2		mg/Kg	EPA 6010		08/31	09/02	DLG
Cadmium	3.3	U	mg/Kg	EPA 6010		08/31	09/02	DLG
Calcium	1800		mg/Kg	EPA 6010		08/31	09/02	DLG
Chromium	31		mg/Kg	EPA 6010		08/31	09/02	DLG

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4327-5
Client Sample ID :LAY-BKGD-SD01 POINT LAY
Matrix :SOIL

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70058
Report Completed :10/08/93
Collected :08/23/93 @ 14:15 hr:
Received :08/25/93 @ 12:00 hr:
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: A. FOLOUSKY AND S.S. SEPPOVEN. THE HIGH DETECTION LIMIT FOR 8270 IS DUE TO THE FACT THAT THE SAMPLE FORMED A THICK SLUDGE WHEN CONCENTRATED DOWN TO 1.0 ML, IT NEEDED TO BE DILUTED.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromochloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromodichloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromoform	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Bromomethane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
n-Butylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
sec-Butylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
tert-Butylbenzne	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Carbon Tetrachloride	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroethane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloroform	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Chloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2-Chlorotoluene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
4-Chlorotoluene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromochloromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
12Dibromo3Chloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dibromoethane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dibromomethane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,4-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Dichlorodifluoromethane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloroethane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloroethene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
cis-1,2-Dichloroethene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
trans1,2-Dichloroethene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,2-Dichloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,3-Dichloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
2,2-Dichloropropane	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
1,1-Dichloropropene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	MCM
Ethylbenzene	0.050	U	mg/Kg	EPA 8260		08/26	09/05	[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS SLE

Chemlab Ref.# :93.4327-5
Client Sample ID :LAY-BKGD-SD01 POINT LAY
Matrix :SOIL

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

		Qualifier		Comment					
2,4,6-Trichlorophenol	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
2,4,5-Trichlorophenol	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
2-Chloronaphthalene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
2-Nitroaniline	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Dimethylphthalate	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Acenaphthylene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
2,6-Dinitrotoluene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
3-Nitroaniline	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Acenaphthene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
2,4-Dinitrophenol	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
4-Nitrophenol	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Dibenzofuran	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
2,4-Dinitrotoluene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Diethylphthalate	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
4-Chlorophenyl-Phenylet	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Fluorene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
4-Nitroaniline	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
4,6-Dinitro-2-Methylphe	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
n-Nitrosodiphenylamine	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
4-Bromophenyl-Phenyleth	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Hexachlorobenzene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Pentachlorophenol	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Phenanthrene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Anthracene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
di-n-Butylphthalate	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Fluoranthene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Pyrene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Butylbenzylphthalate	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
3,3-Dichlorobenzidine	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Benzo(a)Anthracene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Chrysene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
bis(2-Ethylhexyl)Phthal	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
di-n-Octylphthalate	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Benzo(b)Fluoranthene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Benzo(k)Fluoranthene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Benzo(a)Pyrene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Indeno(1,2,3-cd)Pyrene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Dibenz(a,h)Anthracene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Benzo(g,h,i)Perylene	13.0	U	mg/Kg		EPA 8270		09/06	09/30	MTT
Sample Preparation	---				EPA 3050 Digest				
Total Metals Analysis	---				-				
ICP Screen, ICF					EPA	n/a			
Aluminum	19000		mg/Kg		EPA 6010		08/31	09/02	DLG
Antimony	85	U J	mg/Kg	J.2	EPA 6010		08/31	09/02	DLG
Arsenic	85	U	mg/Kg		EPA 6010		08/31	09/02	DLG
Barium	340		mg/Kg		EPA 6010		08/31	09/02	DLG
Beryllium	4.3	U	mg/Kg		EPA 6010		08/31	09/02	DLG
Cadmium	4.3	U	mg/Kg		EPA 6010		08/31	09/02	DLG
Calcium	2000		mg/Kg		EPA 6010		08/31	09/02	DLG
Chromium	33		mg/Kg		EPA 6010		08/31	09/02	DLG

All changes S.L 2/2/94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-5
Client Sample ID :LAY-BKGD-SD01 POINT LAY
Matrix :SOIL

Cobalt	8.6	U	mg/Kg		EPA 6010	08/31	09/02	DLG
Copper	25		mg/Kg		EPA 6010	08/31	09/02	DLG
Iron	33000		mg/Kg		EPA 6010	08/31	09/02	DLG
Lead	17		mg/Kg		EPA 6010	08/31	09/02	DLG
Magnesium	3800		mg/Kg		EPA 6010	08/31	09/02	DLG
Manganese	100	J	mg/Kg	J,2	EPA 6010	08/31	09/02	DLG
Molybdenum	4.3	U	mg/Kg		EPA 6010	08/31	09/02	DLG
Nickel	27		mg/Kg		EPA 6010	08/31	09/02	DLG
Potassium	1200		mg/Kg		EPA 6010	08/31	09/06	DLG
Selenium	85	U J	mg/Kg	J,2 S.L	EPA 6010	08/31	09/02	DLG
Silver	43	U R	mg/Kg	J,1	EPA 6010	08/31	09/02	DLG
Sodium	174		mg/Kg		EPA 6010	08/31	09/06	DLG
Thallium	0.40	U	mg/Kg		EPA 7841	08/30	09/01	KAW
Vanadium	54		mg/Kg		EPA 6010	08/31	09/02	DLG
Zinc	48		mg/Kg		EPA 6010	08/31	09/02	DLG
TOC, Soil	68100		mg/Kg		PSEP Ref Lab			

All changes
2/2/94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-5
Client Sample ID :LAY-BKGD-SW01 POINT LAY
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70060
Report Completed :09/20/93
Collected :08/23/93 @ 13:15 hr
Received :08/25/93 @ 12:00 hr
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-5
Client Sample ID :LAY-BKGD-SW01 POINT LAY
Matrix :WATER

Qualifier | Comments

Methylene Chloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
Napthalene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
n-Propylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
Styrene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
Tetrachloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
Toluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
Trichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
Vinyl Chloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
p+m-Xylene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
o-Xylene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KW
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.35		mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	[illegible]
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	[illegible]
Barium	0.051		mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Calcium	5.5		mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Iron	2.0		mg/L	EPA 6010		09/02	09/06	DLG
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Magnesium	5.0	~~U~~ S.L	mg/L	EPA 6010		09/02	09/06	DLG
Manganese	0.12		mg/L	EPA 6010		09/02	09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Potassium	5.0	U	mg/L	EPA 6010		09/02	09/06	DLG
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.050	U J	mg/L J.1	EPA 6010		09/02	09/06	DLG
Sodium	17		mg/L	EPA 6010		09/15	09/17	DFL
Thallium	0.0050	U	mg/L	EPA 7841		09/02	09/03	KAW
Vanadium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Zinc	0.050	U	mg/L	EPA 6010		09/15	09/17	DFL
Dissolved Metals Analys	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.34		mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG

All changes S.L 2/2/94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4328-5
Client Sample ID :LAY-BKGD-SW01 POINT LAY
Matrix :WATER

Qualifier Comment

Arsenic	0.10	U	mg/L		EPA 6010	09/02	09/06	DL
Barium	0.050	U	mg/L		EPA 6010	09/02	09/06	DL
Beryllium	0.050	U	mg/L		EPA 6010	09/02	09/06	DL
Cadmium	0.050	U	mg/L		EPA 6010	09/02	09/06	DL
Calcium	5.3		mg/L		EPA 6010	09/02	09/06	DL
Chromium	0.050	U	mg/L		EPA 6010	09/02	09/06	DL
Cobalt	0.10	U	mg/L		EPA 6010	09/02	09/06	DL
Copper	0.050	U	mg/L		EPA 6010	09/02	09/06	DL
Iron	1.6		mg/L		EPA 6010	09/02	09/06	DL
Lead	0.10	U	mg/L		EPA 6010	09/02	09/06	DL
Magnesium	4.9		mg/L		EPA 6010	09/02	09/06	DL
Manganese	0.12		mg/L		EPA 6010	09/02	09/06	DL
Molybdenum	0.050	U	mg/L		EPA 6010	09/02	09/06	DL
Nickel	0.050	U	mg/L		EPA 6010	09/02	09/06	DL
Potassium	5.0	U	mg/L		EPA 6010	09/02	09/06	DL
Selenium	0.10	U	mg/L		EPA 6010	09/02	09/06	DL
Silver	0.050	U J	mg/L	J.1	EPA 6010	09/02	09/06	DL
Sodium	17		mg/L		EPA 6010	09/15	09/17	DF
Thallium	0.0050	U	mg/L		EPA 7841	09/02	09/03	KA
Vanadium	0.050	U	mg/L		EPA 6010	09/02	09/06	DL
Zinc	0.050	U	mg/L		EPA 6010	09/15	09/17	DF

TOC, Nonpurgable			EPA 9060	n/a		
...TOC Range	38.6-41.2	mg/L	EPA 9060		09/07	CM
...TOC Concentration	40.0	mg/L	EPA 9060		09/07	CM

All changes
J.L 2/2/94

* See Special Instructions Above	UA = Unavailable
** See Sample Remarks Above	NA = Not Analyzed
U = Undetected, Reported value is the practical quantification limit.	LT = Less Than
D = Secondary dilution.	GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREE
ANCHORAGE, AK 9951
TEL: (907) 562-234
FAX: (907) 561-530

Chemlab Ref.# :93.4329-1
Client Sample ID :LAY-BKGD-SW01 POINT LAY
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70056
Report Completed :09/13/93
Collected :08/23/93 @ 13:15 h:
Received :08/25/93 @ 12:00 h:
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: S.S. SEPPOVEN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Ini
Semivolatile Organics				EPA 8270				
Phenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
bis(2-Chloroethyl)ether	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2-Chlorophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
1,3-Dichlorobenzene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
1,4-Dichlorobenzene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Benzyl Alcohol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
1,2-Dichlorobenzene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2-Methylphenol	0.031	U	mg/L	EPA 8270		08/28	08/30	T
bis(2-Chloroisopropyl)e	0.031	U	mg/L	EPA 8270		08/28	08/30	T
4-Methylphenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
n-Nitroso-di-n-Propylam	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Hexachloroethane	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Nitrobenzene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Isophorone	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2-Nitrophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2,4-Dimethylphenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Benzoic Acid	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
bis(2-Chloroethoxy)Meth	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2,4-Dichlorophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
1,2,4-Trichlorobenzene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Naphthalene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
4-Chloroaniline	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Hexachlorobutadiene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
4-Chloro-3-Methylphenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2-Methylnaphthalene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Hexachlorocyclopentadie	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2,4,6-Trichlorophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2,4,5-Trichlorophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2-Chloronaphthalene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2-Nitroaniline	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Dimethylphthalate	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Acenaphthylene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2,6-Dinitrotoluene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
3-Nitroaniline	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Acenaphthene	0.031	U	mg/L	EPA 8270		08/28	08/30	T
2,4-Dinitrophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	T
4-Nitrophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 9951
TEL: (907) 562-234
FAX: (907) 561-530

Qualifier Comments

Chemlab Ref.# :93.4329-1
Client Sample ID :LAY-BKGD-SW01 POINT LAY
Matrix :WATER

Dibenzofuran	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
2,4-Dinitrotoluene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Diethylphthalate	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
4-Chlorophenyl-Phenylet	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Fluorene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
4-Nitroaniline	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
4,6-Dinitro-2-Methylphe	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
n-Nitrosodiphenylamine	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
4-Bromophenyl-Phenyleth	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Hexachlorobenzene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Pentachlorophenol	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Phenanthrene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Anthracene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
di-n-Butylphthalate	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Fluoranthene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Pyrene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Butylbenzylphthalate	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
3,3-Dichlorobenzidine	0.031	U	mg/L	EPA 8270 (J)-D.1		08/28 08/30	MT
Benzo(a)Anthracene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Chrysene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
bis(2-Ethylhexyl)Phthal	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
di-n-Octylphthalate	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Benzo(b)Fluoranthene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Benzo(k)Fluoranthene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Benzo(a)Pyrene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Indeno(1,2,3-cd)Pyrene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Dibenz(a,h)Anthracene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Benzo(g,h,i)Perylene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Residue, Non-Filterable	6		mg/L	EPA 160.2		08/30 08/31	GF
Residue,Filterable(TDS)	149		mg/L	EPA 160.1	500	09/01 09/02	R

2-4-94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1939

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4328-7
Client Sample ID :LAY-BKGD-SW01 POINT LAY DUPLICATE
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70060
Report Completed :09/17/93
Collected :08/23/93 @ 13:15 hr
Received :08/25/93 @ 12:00 hr
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Total Metals Analysis	---			-		-		
ICP Screen, ICF				EPA	n/a			
Aluminum	0.41		mg/L	EPA 6010		09/02	09/06	DLC
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DLC
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DLC
Barium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Calcium	5.3		mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	[illegible]
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	[illegible]
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Iron	2.0		mg/L	EPA 6010		09/02	09/06	DLG
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Magnesium	5.1		mg/L	EPA 6010		09/02	09/06	DLG
Manganese	0.11		mg/L	EPA 6010		09/02	09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Potassium	5.0	U	mg/L	EPA 6010		09/02	09/06	DLG
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Sodium	17		mg/L	EPA 6010		09/15	09/17	DFL
Thallium	0.0050	U	mg/L	EPA 7841		09/02	09/03	KAW
Vanadium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Zinc	0.050	U	mg/L	EPA 6010		09/15	09/17	DFL
Dissolved Metals Analys	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.32		mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Calcium	5.3		mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-7
Client Sample ID :LAY-BKGD-SW01 POINT LAY DUPLICATE
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Iron	1.6		mg/L	EPA 6010		09/02	09/06	DLG
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Magnesium	4.9		mg/L	EPA 6010		09/02	09/06	DLG
Manganese	0.12		mg/L	EPA 6010		09/02	09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Potassium	5.0	U	mg/L	EPA 6010		09/02	09/06	DLG
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Sodium	17		mg/L	EPA 6010		09/02	09/06	DLG
Thallium	0.0050	U	mg/L	EPA 6010		09/15	09/17	DFL
Vanadium	0.050	U	mg/L	EPA 7841		09/02	09/03	KAW
Zinc	0.053		mg/L	EPA 6010		09/02	09/06	DLG
			mg/L	EPA 6010		09/15	09/17.	DFL
TOC, Nonpurgable				EPA 9060	n/a			
...TOC Range	38.7-40.3		mg/L	EPA 9060			09/07	CMR
...TOC Concentration	39.6		mg/L	EPA 9060			09/07	CMR

==

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 9951
TEL: (907) 562-234
FAX: (907) 561-530

Chemlab Ref.# :93.4329-2
Client Sample ID :LAY-BKGD-SW01 POINT LAY SPIKE
Matrix :WATER

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70056
Ordered By	:RAY MORRIS	Report Completed	:09/13/93
Project Name	:DEW LINE RI/FS	Collected	:08/23/93 @ 13:15 hr
Project#	:41096-412-01	Received	:08/25/93 @ 12:00 hr
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	:

Sample Remarks: SAMPLE COLLECTED BY: S.S. SEPPOVEN. SEE QC PACKAGE FOR SPIKE CONCENTRATION.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Ini
Semivolatile Organics				EPA 8270				
Phenol	0.130		mg/L	EPA 8270		08/28	08/30	MT
bis(2-Chloroethyl)ether	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2-Chlorophenol	0.186		mg/L	EPA 8270		08/28	08/30	MT
1,3-Dichlorobenzene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
1,4-Dichlorobenzene	0.182		mg/L	EPA 8270		08/28	08/30	MT
Benzyl Alcohol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
1,2-Dichlorobenzene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2-Methylphenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
bis(2-Chloroisopropyl)e	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
4-Methylphenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
n-Nitroso-di-n-Propylam	0.229		mg/L	EPA 8270		08/28	08/30	MT
Hexachloroethane	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Nitrobenzene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Isophorone	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2-Nitrophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2,4-Dimethylphenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Benzoic Acid	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
bis(2-Chloroethoxy)Meth	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2,4-Dichlorophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
1,2,4-Trichlorobenzene	0.195		mg/L	EPA 8270		08/28	08/30	MT
Naphthalene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
4-Chloroaniline	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Hexachlorobutadiene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
4-Chloro-3-Methylphenol	0.221		mg/L	EPA 8270		08/28	08/30	MT
2-Methylnaphthalene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Hexachlorocyclopentadie	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2,4,6-Trichlorophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2,4,5-Trichlorophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2-Chloronaphthalene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2-Nitroaniline	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Dimethylphthalate	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Acenaphthylene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2,6-Dinitrotoluene	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
3-Nitroaniline	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
Acenaphthene	0.201		mg/L	EPA 8270		08/28	08/30	MT
2,4-Dinitrophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 9951
TEL: (907) 562-234
FAX: (907) 561-530

Chemlab Ref.# :93.4329-2
Client Sample ID :LAY-BKGD-SW01 POINT LAY SPIKE
Matrix :WATER

4-Nitrophenol	0.114		mg/L	EPA 8270	08/28	08/30	MT
Dibenzofuran	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
2,4-Dinitrotoluene	0.234		mg/L	EPA 8270	08/28	08/30	MT
Diethylphthalate	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
4-Chlorophenyl-Phenylet	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Fluorene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
4-Nitroaniline	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
4,6-Dinitro-2-Methylphe	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
n-Nitrosodiphenylamine	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
4-Bromophenyl-Phenyleth	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Hexachlorobenzene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Pentachlorophenol	0.150		mg/L	EPA 8270	08/28	08/30	MT
Phenanthrene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Anthracene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
di-n-Butylphthalate	0.258		mg/L	EPA 8270	08/28	08/30	MT
Fluoranthene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Pyrene	0.244		mg/L	EPA 8270	08/28	08/30	MT
Butylbenzylphthalate	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
3,3-Dichlorobenzidine	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(a)Anthracene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Chrysene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
bis(2-Ethylhexyl)Phthal	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
di-n-Octylphthalate	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(b)Fluoranthene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(k)Fluoranthene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(a)Pyrene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Indeno(1,2,3-cd)Pyrene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Dibenz(a,h)Anthracene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(g,h,i)Perylene	0.031	U	mg/L	EPA 8270	08/28	08/30	MT

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREE
ANCHORAGE, AK 9951
TEL: (907) 562-234
FAX: (907) 561-530

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-6
Client Sample ID :LAY-BKGD-SW01 POINT LAY SPIKE
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70060
Report Completed :09/20/93
Collected :08/23/93 @ 13:15 hr
Received :08/25/93 @ 12:00 hr
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Ini
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	1.35		mg/L	EPA 6010		09/02	09/06	DL
Antimony	0.88		mg/L	EPA 6010		09/02	09/06	DL
Arsenic	0.93		mg/L	EPA 6010		09/02	09/06	DL
Barium	1.03		mg/L	EPA 6010		09/02	09/06	DL
Beryllium	0.39		mg/L	EPA 6010		09/02	09/06	DL
Cadmium	0.49		mg/L	EPA 6010		09/02	09/06	DL
Calcium	15.0		mg/L	EPA 6010		09/02	09/06	DL
Chromium	1.00		mg/L	EPA 6010		09/02	09/06	DL
Cobalt	0.98		mg/L	EPA 6010		09/02	09/06	L
Copper	0.96		mg/L	EPA 6010		09/02	09/06	DL
Iron	2.93		mg/L	EPA 6010		09/02	09/06	DL
Lead	0.92		mg/L	EPA 6010		09/02	09/06	DL
Magnesium	13.9		mg/L	EPA 6010		09/02	09/06	DL
Manganese	1.13		mg/L	EPA 6010		09/02	09/06	DL
Molybdenum	0.99		mg/L	EPA 6010		09/02	09/06	DL
Nickel	0.99		mg/L	EPA 6010		09/02	09/06	DL
Potassium	8.3		mg/L	EPA 6010		09/02	09/06	DL
Selenium	0.89		mg/L	EPA 6010		09/02	09/06	DL
Silver	0.13		mg/L	EPA 6010		09/02	09/06	DL
Sodium	27		mg/L	EPA 6010		09/02	09/06	DL
Thallium	0.017		mg/L	EPA 7841		09/15	09/17	DFI
Vanadium	0.96		mg/L	EPA 6010		09/02	09/03	KA
Zinc	0.97		mg/L	EPA 6010		09/15	09/17	DFI
Dissolved Metals Analys	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	1.4		mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.89		mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.90		mg/L	EPA 6010		09/02	09/06	DLG
Barium	1.05		mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.40		mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.50		mg/L	EPA 6010		09/02	09/06	DLG
Calcium	15.0		mg/L	EPA 6010		09/02	09/06	DLG
Chromium	1.01		mg/L	EPA 6010		09/02	09/06	DLG
Cobalt	1.00		mg/L	EPA 6010		09/02	09/06	DLG
Copper	1.00		mg/L	EPA 6010		09/02	09/06	LG

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-6
Client Sample ID :LAY-BKGD-SW01 POINT LAY SPIKE
Matrix :WATER

Iron	2.6	mg/L	EPA 6010		09/02	09/06	DL
Lead	0.94	mg/L	EPA 6010		09/02	09/06	DL
Magnesium	14.1	mg/L	EPA 6010		09/02	09/06	DL
Manganese	1.17	mg/L	EPA 6010		09/02	09/06	DL
Molybdenum	0.98	mg/L	EPA 6010		09/02	09/06	DL
Nickel	1.01	mg/L	EPA 6010		09/02	09/06	DL
Potassium	8.7	mg/L	EPA 6010		09/02	09/06	DL
Selenium	0.90	mg/L	EPA 6010		09/02	09/06	DL
Silver	0.13	mg/L	EPA 6010		09/02	09/06	DL
Sodium	27	mg/L	EPA 6010		09/15	09/17	DF
Thallium	0.016	mg/L	EPA 7841		09/02	09/03	KA
Vanadium	0.97	mg/L	EPA 6010		09/02	09/06	DL
Zinc	1.0	mg/L	EPA 6010		09/15	09/17	DF
TOC, Nonpurgable			EPA 9060	n/a			
...TOC Range	52.6-56.7	mg/L	EPA 9060			09/07	CM
...TOC Concentration	54.3	mg/L	EPA 9060			09/07	CM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4329-3
Client Sample ID :LAY-BKGD-SW01 POINT LAY SPIKE DUPLICATE
Matrix :WATER

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70056
Ordered By	:RAY MORRIS	Report Completed	:09/21/93
Project Name	:DEW LINE RI/FS	Collected	:08/23/93 @ 13:15 hr
Project#	:41096-412-01	Received	:08/25/93 @ 12:00 hr
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	:

Sample Remarks: SAMPLE COLLECTED BY: S.S. SEPPOVEN. SEE QC PACKAGE FOR SPIKE CONCENTRATION. CORRECTED DUPLICATE TO SPIKE DUPLICATE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Ini
Semivolatile Organics				EPA 8270				
Phenol	0.167		mg/L	EPA 8270		08/28	08/30	MT
bis(2-Chloroethyl)ether	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2-Chlorophenol	0.231		mg/L	EPA 8270		08/28	08/30	MT
1,3-Dichlorobenzene	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
1,4-Dichlorobenzene	0.209		mg/L	EPA 8270		08/28	08/30	MT
Benzyl Alcohol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
1,2-Dichlorobenzene	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2-Methylphenol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
bis(2-Chloroisopropyl)e	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
4-Methylphenol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
n-Nitroso-di-n-Propylam	0.244		mg/L	EPA 8270		08/28	08/30	MT
Hexachloroethane	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
Nitrobenzene	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
Isophorone	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2-Nitrophenol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2,4-Dimethylphenol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
Benzoic Acid	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
bis(2-Chloroethoxy)Meth	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2,4-Dichlorophenol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
1,2,4-Trichlorobenzene	0.231		mg/L	EPA 8270		08/28	08/30	MT
Naphthalene	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
4-Chloroaniline	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
Hexachlorobutadiene	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
4-Chloro-3-Methylphenol	0.254		mg/L	EPA 8270		08/28	08/30	MT
2-Methylnaphthalene	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
Hexachlorocyclopentadie	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2,4,6-Trichlorophenol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2,4,5-Trichlorophenol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2-Chloronaphthalene	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2-Nitroaniline	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
Dimethylphthalate	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
Acenaphthylene	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2,6-Dinitrotoluene	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
3-Nitroaniline	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
Acenaphthene	0.239		mg/L	EPA 8270		08/28	08/30	MT
2,4-Dinitrophenol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4329-3
Client Sample ID :LAY-BKGD-SW01 POINT LAY SPIKE DUPLICATE
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

4-Nitrophenol	0.177		mg/L	EPA 8270	08/28	08/30	MT
Dibenzofuran	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
2,4-Dinitrotoluene	0.241		mg/L	EPA 8270	08/28	08/30	MT
Diethylphthalate	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
4-Chlorophenyl-Phenylet	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Fluorene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
4-Nitroaniline	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
4,6-Dinitro-2-Methylphe	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
n-Nitrosodiphenylamine	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
4-Bromophenyl-Phenyleth	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Hexachlorobenzene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Pentachlorophenol	0.229		mg/L	EPA 8270	08/28	08/30	MT
Phenanthrene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Anthracene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
di-n-Butylphthalate	0.263		mg/L	EPA 8270	08/28	08/30	MT
Fluoranthene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Pyrene	0.256		mg/L	EPA 8270	08/28	08/30	MT
Butylbenzylphthalate	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
3,3-Dichlorobenzidine	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(a)Anthracene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Chrysene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
bis(2-Ethylhexyl)Phthal	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
di-n-Octylphthalate	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(b)Fluoranthene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(k)Fluoranthene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(a)Pyrene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Indeno(1,2,3-cd)Pyrene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Dibenz(a,h)Anthracene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(g,h,i)Perylene	0.035	U	mg/L	EPA 8270	08/28	08/30	MT

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-8
Client Sample ID :LAY-BKGD-SW02 POINT LAY
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70060
Report Completed :09/20/93
Collected :08/23/93 @ 11:15 hrs
Received :08/25/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	[illegible]
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	[illegible]
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4328-8
Client Sample ID :LAY-BKGD-SW02 POINT LAY
Matrix :WATER

Methylene Chloride	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
Napthalene	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
n-Propylbenzene	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
Styrene	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
Tetrachloroethene	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
Toluene	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
Trichloroethene	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWI
Vinyl Chloride	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWM
p+m-Xylene	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWM
o-Xylene	0.0010	U	mg/L	EPA 8260		09/02 09/02	KWM
Total Metals Analysis	---			-			
ICP Screen, ICF				EPA	n/a		
Aluminum	0.13		mg/L	EPA 6010		09/02 09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02 09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010		09/02 09/06	DLG
Barium	0.056		mg/L	EPA 6010		09/02 09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02 09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02 09/06	DLG
Calcium	9.0		mg/L	EPA 6010		09/02 09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02 09/06	DLG
Cobalt	0.10	U	mg/L	EPA 6010		09/02 09/06	DLG
Copper	0.050	U	mg/L	EPA 6010		09/02 09/06	DLG
Iron	2.8		mg/L	EPA 6010		09/02 09/06	DLG
Lead	0.10	U	mg/L	EPA 6010		09/02 09/06	DLG
Magnesium	5.5		mg/L	EPA 6010		09/02 09/06	DLG
Manganese	0.51		mg/L	EPA 6010		09/02 09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010		09/02 09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010		09/02 09/06	DLG
Potassium	5.0	U	mg/L	EPA 6010		09/02 09/06	DLG
Selenium	0.10	U	mg/L	EPA 6010		09/02 09/06	DLG
Silver	0.050	U	mg/L	EPA 6010		09/02 09/06	DLG
Sodium	18		mg/L	EPA 6010		09/15 09/17	DFL
Thallium	0.0050	U	mg/L	EPA 7841		09/02 09/03	KAW
Vanadium	0.050	U	mg/L	EPA 6010		09/02 09/06	DLG
Zinc	0.16		mg/L	EPA 6010		09/15 09/17	DFL
Dissolved Metals Analys	---			-			
ICP Screen, ICF				EPA	n/a		
Aluminum	0.10	U	mg/L	EPA 6010		09/02 09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02 09/06	DLG

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4328-8
Client Sample ID :LAY-BKGD-SW02 POINT LAY
Matrix :WATER

Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Barium	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Calcium	8.6		mg/L	EPA 6010		09/02	09/06	DL
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Iron	0.95		mg/L	EPA 6010		09/02	09/06	DL
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Magnesium	5.5		mg/L	EPA 6010		09/02	09/06	DL
Manganese	0.066		mg/L	EPA 6010		09/02	09/06	DL
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Potassium	5.0	U	mg/L	EPA 6010		09/02	09/06	DL
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Sodium	19		mg/L	EPA 6010		09/02	09/06	DL
Thallium	0.0050	U	mg/L	EPA 6010		09/15	09/17	DF
Vanadium	0.050	U	mg/L	EPA 7841		09/02	09/03	KA
Zinc	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
	0.050	U	mg/L	EPA 6010		09/15	09/17	DF
TOC, Nonpurgable				EPA 9060	n/a			
...TOC Range	28.9-33.7		mg/L	EPA 9060			09/07	CM
...TOC Concentration	31.7		mg/L	EPA 9060			09/07	CM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4329-4
Client Sample ID :LAY-BKGD-SW02 POINT LAY
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70056
Report Completed :09/13/93
Collected :08/23/93 @ 11:15 hrs
Received :08/25/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : [signature]

Sample Remarks: SAMPLE COLLECTED BY: S.S. SEPPOVEN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics				EPA 8270				
Phenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
bis(2-Chloroethyl)ether	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Chlorophenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
1,3-Dichlorobenzene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
1,4-Dichlorobenzene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
Benzyl Alcohol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
1,2-Dichlorobenzene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Methylphenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
bis(2-Chloroisopropyl)e	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
4-Methylphenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
n-Nitroso-di-n-Propylam	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
Hexachloroethane	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
Nitrobenzene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
Isophorone	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Nitrophenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4-Dimethylphenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
Benzoic Acid	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
bis(2-Chloroethoxy)Meth	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4-Dichlorophenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
1,2,4-Trichlorobenzene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
Naphthalene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
4-Chloroaniline	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
Hexachlorobutadiene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
4-Chloro-3-Methylphenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Methylnaphthalene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
Hexachlorocyclopentadie	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4,6-Trichlorophenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4,5-Trichlorophenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Chloronaphthalene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Nitroaniline	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
Dimethylphthalate	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
Acenaphthylene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
2,6-Dinitrotoluene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
3-Nitroaniline	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
Acenaphthene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4-Dinitrophenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT
4-Nitrophenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MTT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4329-4
Client Sample ID :LAY-BKGD-SW02 POINT LAY
Matrix :WATER

Dibenzofuran	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
2,4-Dinitrotoluene	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
Diethylphthalate	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
4-Chlorophenyl-Phenylet	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
Fluorene	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
4-Nitroaniline	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
4,6-Dinitro-2-Methylphe	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
n-Nitrosodiphenylamine	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
4-Bromophenyl-Phenyleth	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
Hexachlorobenzene	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
Pentachlorophenol	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
Phenanthrene	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
Anthracene	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
di-n-Butylphthalate	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
Fluoranthene	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
Pyrene	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
Butylbenzylphthalate	0.020	U	mg/L	EPA 8270		08/28	08/30	MTI
3,3-Dichlorobenzidine	0.020	U	mg/L	EPA 8270		08/28	08/30	MT
Benzo(a)Anthracene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTI
Chrysene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTI
bis(2-Ethylhexyl)Phthal	0.020	U	mg/L	EPA 8270		08/28	08/30	MTI
di-n-Octylphthalate	0.020	U	mg/L	EPA 8270		08/28	08/30	MTI
Benzo(b)Fluoranthene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTI
Benzo(k)Fluoranthene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTI
Benzo(a)Pyrene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTI
Indeno(1,2,3-cd)Pyrene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTI
Dibenz(a,h)Anthracene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTI
Benzo(g,h,i)Perylene	0.020	U	mg/L	EPA 8270		08/28	08/30	MTI
*Residue, Non-Filterable	77		mg/L	EPA 160.2		08/30	08/31	GPF
Residue,Filterable(TDS)	151		mg/L	EPA 160.1	500	09/01	09/02	RJH

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

ICF ID	LAY-BKGD-S01	LAY-BKGD-S02	LAY-BKGD-S03	LAY-BKGD-S04
F&BI Number	433	435	437	439
Sample Type	soil	soil	soil	soil
Date Received	8/24/93	8/24/93	8/24/93	8/24/93
% Dry Weight	64	46	52	75
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93
Leaded Gas				
JP-4	<80	<100	<100	<100
Lube Oil	<100	<100	<100	<100
Diesel	<80	<100	<100	~~<100~~ <70
Spike Level				
Unknown Semi-volatile	40 biological	270 biological	60 biological	90 biological
Pentacosane	113	103	90	107
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93
PCB 1221	<0.1	~~<0.1~~ <0.2	~~<0.1~~ <0.2	<0.1
PCB 1232	<0.1	~~<0.1~~ <0.2	~~<0.1~~ <0.2	<0.1
PCB 1016	<0.1	~~<0.1~~ <0.2	~~<0.1~~ <0.2	<0.1
PCB 1242	<0.1	~~<0.1~~ <0.2	~~<0.1~~ <0.2	<0.1
PCB 1248	<0.1	~~<0.1~~ <0.2	~~<0.1~~ <0.2	<0.1
PCB 1254	<0.1	~~<0.1~~ <0.2	~~<0.1~~ <0.2	<0.1
PCB 1260	<0.1	~~<0.1~~ <0.2	~~<0.1~~ <0.2	<0.1
Spike Level				
Dibutyl Chlorendate	150	120	120	124
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93
alpha-BHC	<0.02 J	<0.02 J	<0.02 J	<0.02 J
beta-BHC	<0.02 J	<0.02 J	<0.02 J	<0.02 J
gamma-BHC	<0.02 J	<0.02 J	<0.02 J	<0.02 J
delta-BHC	<0.02 J	<0.02 J	<0.02 J	<0.02 J
Heptachlor	<0.02 J	<0.02 J	<0.02 J	<0.02 J
Aldrin	<0.02 J	<0.02 J	<0.02 J	<0.02 J
Heptachlor Epoxide	<0.02 J	<0.02 J	<0.02 J	<0.02 J
Endosulfan I	<0.02 J	<0.02 J	<0.02 J	<0.02 J
DDE	<0.02 J	<0.02 J	<0.02 J	<0.02 J
Dieldrin	<0.02 J	<0.02 J	<0.02 J	<0.02 J
Endrin	<0.02 J	<0.02 J	<0.02 J	<0.02 J
Endosulfan II	<0.02 J	<0.02 J	<0.02 J	<0.02 J
DDD	<0.02 J	<0.02 J	<0.02 J	<0.02 J
Endrin Aldehyde	<0.02 J	<0.02 J	<0.02 J	<0.02 J
DDT	<0.02 J	<0.02 J	<0.02 J	<0.02 J
Endosulfan Sulfate	<0.02 J	<0.02 J	<0.02 J	<0.02 J
Endrin Ketone	<0.02 J	<0.02 J	<0.02 J	<0.02 J
Methoxy Chlor	~~<0.1~~ <0.5	~~<0.1~~ <0.5	~~<0.1~~ <0.5	~~<0.1~~ <0.5
Chlordane	<0.5 J	<0.5 J	<0.5 J	<0.5 J
Dibutyl Chlorendate	150	120	120	124
Spike Level				
Vol Sequence	#1&2-08/24/93	#1&2-08/24/93	#1&2-08/24/93	#1&2-08/24/93
CCl4	<0.03	<0.04	<0.04	<0.03
TCA	<0.03	<0.04	<0.04	<0.03
Benzene	<0.02	<0.04	<0.04	<0.03
TCE	<0.03	<0.04	<0.04	<0.03
Toluene	<0.02	<0.04	<0.04	<0.03
PCE	<0.03	<0.04	<0.04	<0.03
Ethylbenzene	<0.03	<0.04	<0.04	<0.04
Xylenes	<0.06	<0.08	<0.08	<0.08
Gasoline	<3 J	<4 J	<4 J	<3 J
Spike level				
BFB	102	101	97	105

RJB
6-14-95

ICF ID	LAY-BKGD-SD01	LAY-BKGD-SW01	LAT-BKGD-SW01
F&BI Number	431	448	457
Sample Type	soil	water	water
Date Received	8/24/93	8/24/93	8/24/93
% Dry Weight	64		
Sequence Date	#5-08/24/93		#5-08/25/93
Leaded Gas			
JP-4	<50		<1000
Lube Oil	<100		<2000
Diesel	<50		<1000
Spike Level			
Unknown Semi-volatile			
Pentacosane	103		76
Sequence Date	#5-08/24/93		#5-08/25/93
PCB 1221	<0.1		<2
PCB 1232	<0.1		<2
PCB 1016	<0.1		<2
PCB 1242	<0.1		<2
PCB 1248	<0.1		<2
PCB 1254	<0.1		<2
PCB 1260	<0.1		<2
Spike Level			
Dibutyl Chlorendate	112		68
Sequence Date	#5-08/24/93		#5-08/25/93
alpha-BHC	<0.02 J		~~<2~~ <0.2 J
beta-BHC	<0.02 J		~~<2~~ <0.2 J
gamma-BHC	<0.02 J		~~<2~~ <0.2 J
delta-BHC	<0.02 J		~~<2~~ <0.2 J
Heptachlor	<0.02 J		~~<2~~ <0.2 J
Aldrin	<0.02 J		~~<2~~ <0.2 J
Heptachlor Epoxide	<0.02 J		~~<2~~ <0.2 J
Endosulfan I	<0.02 J		~~<2~~ <0.2 J
DDE	<0.02 J		~~<2~~ <0.2 J
Dieldrin	<0.02 J		~~<2~~ <0.2 J
Endrin	<0.02 J		~~<2~~ <0.2 J
Endosulfan II	<0.02 J		~~<2~~ <0.2 J
DDD	<0.02 J		~~<2~~ <0.2 J
Endrin Aldehyde	<0.02 J		~~<2~~ <0.2 J
DDT	<0.02 J		~~<2~~ <0.2 J
Endosulfan Sulfate	<0.02 J		~~<2~~ <0.2 J
Endrin Ketone	<0.02 J		~~<2~~ <0.2 J
Methoxy Chlor	~~<0.1~~ <0.5 J		<10 J
Chlordane	~~<0.5~~ <0.5 J		<50 J
Dibutyl Chlorendate	112		68
Spike Level			
Vol Sequence	#3&4-08/27/93	#3&4-08/24/93	
CCl4	<0.03	<1	
TCA	<0.03	<1	
Benzene	<0.03	<1	
TCE	<0.03	<1	
Toluene	<0.03	<1	
PCE	<0.03	<1	
Ethylbenzene	<0.03	<1	
Xylenes	<0.04	<2	
Gasoline	<3 J	<50 J	
Spike level			
BFB	70	108	

RJB
6-14-95

ICF ID	LAY-BKGD-SW02	LAY-BKGD-SW02
F&BI Number	461	462
Sample Type	water	water
Date Received	8/24/93	8/24/93
% Dry Weight		
Sequence Date		#5-08/25/93
Leaded Gas		
JP-4		<1000
Lube Oil		<2000
Diesel		<1000
Spike Level		
Unknown Semi-volatile		
Pentacosane		78
Sequence Date		#5-08/25/93
PCB 1221		<2
PCB 1232		<2
PCB 1016		<2
PCB 1242		<2
PCB 1248		<2
PCB 1254		<2
PCB 1260		<2
Spike Level		
Dibutyl Chlorendate		82
Sequence Date		#5-08/25/93
alpha-BHC		~~<2~~ <0.2 J
beta-BHC		~~<2~~ <0.2 J
gamma-BHC		~~<2~~ <0.2 J
delta-BHC		~~<2~~ <0.2 J
Heptachlor		~~<2~~ <0.2 J
Aldrin		~~<2~~ <0.2 J
Heptachlor Epoxide		~~<2~~ <0.2 J
Endosulfan I		~~<2~~ <0.2 J
DDE		~~<2~~ <0.2 J
Dieldrin		~~<2~~ <0.2 J
Endrin		~~<2~~ <0.2 J
Endosulfan II		~~<2~~ <0.2 J
DDD		~~<2~~ <0.2 J
Endrin Aldehyde		~~<2~~ <0.2 J
DDT		~~<2~~ <0.2 J
Endosulfan Sulfate		~~<2~~ <0.2 J
Endrin Ketone		~~<2~~ <0.2 J
Methoxy Chlor		<10 J
Chlordane		<50 J
Dibutyl Chlorendate		80
Spike Level		
Vol Sequence	#3&4-08/24/93	
CCl4	<1	
TCA	<1	
Benzene	<1	
TCE	<1	
Toluene	<1	
PCE	<1	
Ethylbenzene	<1	
Xylenes	<2	
Gasoline	<50 J	
Spike level		
BFB	101	

RJB
6-14-95

ANALYTICAL DATA SHEETS FOR QA/QC

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-5
Client Sample ID :LAY-AB01 POINT LAY
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70116
Report Completed :10/06/93
Collected :08/24/93 @ 13:46 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-5
Client Sample ID :LAY-AB01 POINT LAY
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Methylene Chloride	0.0031		mg/L	EPA 8260	09/02	09/02	MCM
Napthalene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Styrene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Toluene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Trichloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-2
Client Sample ID :LAY-EB01 POINT LAY
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70060
Report Completed :09/20/93
Collected :08/23/93 @ 13:45 hrs
Received :08/25/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4328-2
Client Sample ID :LAY-EB01 POINT LAY
Matrix :WATER

Methylene Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Napthalene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Styrene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Toluene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Trichloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Semivolatile Organics				EPA 8270			
Phenol	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
bis(2-Chloroethyl)ether	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
2-Chlorophenol	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
1,3-Dichlorobenzene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
1,4-Dichlorobenzene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Benzyl Alcohol	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
1,2-Dichlorobenzene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
2-Methylphenol	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
bis(2-Chloroisopropyl)e	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
4-Methylphenol	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
n-Nitroso-di-n-Propylam	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Hexachloroethane	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Nitrobenzene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Isophorone	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
2-Nitrophenol	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
2,4-Dimethylphenol	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Benzoic Acid	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
bis(2-Chloroethoxy)Meth	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
2,4-Dichlorophenol	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
1,2,4-Trichlorobenzene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Naphthalene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
4-Chloroaniline	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Hexachlorobutadiene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
4-Chloro-3-Methylphenol	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
2-Methylnaphthalene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Hexachlorocyclopentadie	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
2,4,6-Trichlorophenol	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
2,4,5-Trichlorophenol	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
2-Chloronaphthalene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-2
Client Sample ID :LAY-EB01 POINT LAY
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

2-Nitroaniline	0.036	U	mg/L	EPA 8270		08/28	08/30	MT
Dimethylphthalate	0.036	U	mg/L	EPA 8270		08/28	08/30	MT
Acenaphthylene	0.036	U	mg/L	EPA 8270		08/28	08/30	MT
2,6-Dinitrotoluene	0.036	U	mg/L	EPA 8270		08/28	08/30	MT
3-Nitroaniline	0.036	U	mg/L	EPA 8270		08/28	08/30	MT
Acenaphthene	0.036	U	mg/L	EPA 8270		08/28	08/30	MT
2,4-Dinitrophenol	0.036	U	mg/L	EPA 8270		08/28	08/30	MT
4-Nitrophenol	0.036	U	mg/L	EPA 8270		08/28	08/30	MT
Dibenzofuran	0.036	U	mg/L	EPA 8270		08/28	08/30	MT
2,4-Dinitrotoluene	0.036	U	mg/L	EPA 8270		08/28	08/30	MT
Diethylphthalate	0.036	U	mg/L	EPA 8270		08/28	08/30	MT
4-Chlorophenyl-Phenylet	0.036	U	mg/L	EPA 8270		08/28	08/30	MT
Fluorene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
4-Nitroaniline	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
4,6-Dinitro-2-Methylphe	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
n-Nitrosodiphenylamine	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
4-Bromophenyl-Phenyleth	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Hexachlorobenzene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Pentachlorophenol	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Phenanthrene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Anthracene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
di-n-Butylphthalate	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Fluoranthene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Pyrene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Butylbenzylphthalate	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
3,3-Dichlorobenzidine	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Benzo(a)Anthracene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Chrysene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
bis(2-Ethylhexyl)Phthal	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
di-n-Octylphthalate	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Benzo(b)Fluoranthene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Benzo(k)Fluoranthene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Benzo(a)Pyrene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Indeno(1,2,3-cd)Pyrene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Dibenz(a,h)Anthracene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Benzo(g,h,i)Perylene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Total Metals Analysis	---							
ICP Screen, ICP				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Calcium	0.20	U	mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Iron	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-2
Client Sample ID :LAY-EB01 POINT LAY
Matrix :WATER

		Qualifier		Comment				
Magnesium	0.20 U		mg/L		EPA 6010	09/02	09/06	DL
Manganese	0.050 U		mg/L		EPA 6010	09/02	09/06	DL
Molybdenum	0.050 U		mg/L		EPA 6010	09/02	09/06	DL
Nickel	0.050 U		mg/L		EPA 6010	09/02	09/06	DL
Potassium	5.0 U		mg/L		EPA 6010	09/02	09/06	DL
Selenium	0.10 U		mg/L		EPA 6010	09/02	09/06	DL
Silver	0.050 U	J	mg/L	J.1	EPA 6010	09/02	09/06	DL
Sodium	0.25 U		mg/L		EPA 6010	09/15	09/17	DF
Thallium	0.0050 U		mg/L		EPA 7841	09/02	09/03	KA
Vanadium	0.050 U		mg/L		EPA 6010	09/02	09/06	DL
Zinc	0.050 U		mg/L		EPA 6010	09/15	09/17	DF

All changes s.L 2/2/94

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4328-3
Client Sample ID :LAY-EB01 POINT LAY SPIKE
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70060
Report Completed :09/20/93
Collected :08/23/93 @ 13:45 hrs
Received :08/25/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. FOR SPIKE AND SPIKE DUPLICATE RECOVERIES, SEE QC PACKAGE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics				EPA 8270				
Phenol	0.126		mg/L	EPA 8270		08/28	08/30	MTT
bis(2-Chloroethyl)ether	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Chlorophenol	0.163		mg/L	EPA 8270		08/28	08/30	MTT
1,3-Dichlorobenzene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
1,4-Dichlorobenzene	0.173		mg/L	EPA 8270		08/28	08/30	MTT
Benzyl Alcohol	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
1,2-Dichlorobenzene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Methylphenol	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
bis(2-Chloroisopropyl)e	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
4-Methylphenol	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
n-Nitroso-di-n-Propylam	0.214		mg/L	EPA 8270		08/28	08/30	MTT
Hexachloroethane	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Nitrobenzene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Isophorone	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Nitrophenol	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4-Dimethylphenol	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Benzoic Acid	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
bis(2-Chloroethoxy)Meth	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4-Dichlorophenol	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
1,2,4-Trichlorobenzene	0.198		mg/L	EPA 8270		08/28	08/30	MTT
Naphthalene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
4-Chloroaniline	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Hexachlorobutadiene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
4-Chloro-3-Methylphenol	0.194		mg/L	EPA 8270		08/28	08/30	MTT
2-Methylnaphthalene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Hexachlorocyclopentadie	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4,6-Trichlorophenol	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4,5-Trichlorophenol	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Chloronaphthalene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Nitroaniline	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Dimethylphthalate	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Acenaphthylene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
2,6-Dinitrotoluene	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
3-Nitroaniline	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT
Acenaphthene	0.209		mg/L	EPA 8270		08/28	08/30	MTT
2,4-Dinitrophenol	0.036	U	mg/L	EPA 8270		08/28	08/30	MTT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4328-3
Client Sample ID :LAY-EB01 POINT LAY SPIKE
Matrix :WATER

4-Nitrophenol	0.129		mg/L	EPA 8270	08/28	08/30	MT
Dibenzofuran	0.036	U	mg/L	EPA 8270	08/28	08/30	MT
2,4-Dinitrotoluene	0.203		mg/L	EPA 8270	08/28	08/30	MT
Diethylphthalate	0.036	U	mg/L	EPA 8270	08/28	08/30	MT
4-Chlorophenyl-Phenylet	0.036	U	mg/L	EPA 8270	08/28	08/30	MT
Fluorene	0.036	U	mg/L	EPA 8270	08/28	08/30	MT
4-Nitroaniline	0.036	U	mg/L	EPA 8270	08/28	08/30	MT
4,6-Dinitro-2-Methylphe	0.036	U	mg/L	EPA 8270	08/28	08/30	MT
n-Nitrosodiphenylamine	0.036	U	mg/L	EPA 8270	08/28	08/30	MT
4-Bromophenyl-Phenyleth	0.036	U	mg/L	EPA 8270	08/28	08/30	MT
Hexachlorobenzene	0.036	U	mg/L	EPA 8270	08/28	08/30	MT
Pentachlorophenol	0.143		mg/L	EPA 8270	08/28	08/30	MT
Phenanthrene	0.036	U	mg/L	EPA 8270	08/28	08/30	MT
Anthracene	0.036	U	mg/L	EPA 8270	08/28	08/30	MT
di-n-Butylphthalate	0.213		mg/L	EPA 8270	08/28	08/30	MT
Fluoranthene	0.036	U	mg/L	EPA 8270	08/28	08/30	MT
Pyrene	0.212		mg/L	EPA 8270	08/28	08/30	MTT
Butylbenzylphthalate	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
3,3-Dichlorobenzidine	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Benzo(a)Anthracene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Chrysene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
bis(2-Ethylhexyl)Phthal	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
di-n-Octylphthalate	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Benzo(b)Fluoranthene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Benzo(k)Fluoranthene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Benzo(a)Pyrene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Indeno(1,2,3-cd)Pyrene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Dibenz(a,h)Anthracene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT
Benzo(g,h,i)Perylene	0.036	U	mg/L	EPA 8270	08/28	08/30	MTT

==

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX (907) 561-5301

Chemlab Ref.# :93.4328-4
Client Sample ID :LAY-EB01 POINT LAY SPIKE DUPLICATE
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70060
Report Completed :09/20/93
Collected :08/23/93 @ 13:45 hrs
Received :08/25/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. FOR SPIKE AND SPIKE DUPLICATE RECOVERIES, SEE QC PACKAGE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics				EPA 8270				
Phenol	0.186		mg/L	EPA 8270		08/28	08/30	MTT
bis(2-Chloroethyl)ether	0.040	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Chlorophenol	0.239		mg/L	EPA 8270		08/28	08/30	MTT
1,3-Dichlorobenzene	0.040	U	mg/L	EPA 8270		08/28	08/30	MTT
1,4-Dichlorobenzene	0.268		mg/L	EPA 8270		08/28	08/30	MTT
Benzyl Alcohol	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
1,2-Dichlorobenzene	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Methylphenol	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
bis(2-Chloroisopropyl)e	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
4-Methylphenol	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
n-Nitroso-di-n-Propylam	0.320		mg/L	EPA 8270		08/28	08/30	MTT
Hexachloroethane	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
Nitrobenzene	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
Isophorone	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Nitrophenol	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4-Dimethylphenol	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
Benzoic Acid	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
bis(2-Chloroethoxy)Meth	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4-Dichlorophenol	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
1,2,4-Trichlorobenzene	0.295		mg/L	EPA 8270		08/28	08/30	MTT
Naphthalene	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
4-Chloroaniline	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
Hexachlorobutadiene	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
4-Chloro-3-Methylphenol	0.263		mg/L	EPA 8270		08/28	08/30	MTT
2-Methylnaphthalene	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
Hexachlorocyclopentadie	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4,6-Trichlorophenol	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4,5-Trichlorophenol	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Chloronaphthalene	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Nitroaniline	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
Dimethylphthalate	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
Acenaphthylene	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
2,6-Dinitrotoluene	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
3-Nitroaniline	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
Acenaphthene	0.308		mg/L	EPA 8270		08/28	08/30	MTT
2,4-Dinitrophenol	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL. (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-4
Client Sample ID :LAY-EB01 POINT LAY SPIKE DUPLICATE
Matrix :WATER

4-Nitrophenol	0.142		mg/L	EPA 8270	08/28	08/30	MT
Dibenzofuran	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
2,4-Dinitrotoluene	0.301		mg/L	EPA 8270	08/28	08/30	MT
Diethylphthalate	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
4-Chlorophenyl-Phenylet	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Fluorene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
4-Nitroaniline	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
4,6-Dinitro-2-Methylphe	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
n-Nitrosodiphenylamine	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
4-Bromophenyl-Phenyleth	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Hexachlorobenzene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Pentachlorophenol	0.162		mg/L	EPA 8270	08/28	08/30	MT
Phenanthrene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Anthracene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
di-n-Butylphthalate	0.309		mg/L	EPA 8270	08/28	08/30	MT
Fluoranthene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Pyrene	0.311		mg/L	EPA 8270	08/28	08/30	MT
Butylbenzylphthalate	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
3,3-Dichlorobenzidine	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(a)Anthracene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Chrysene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
bis(2-Ethylhexyl)Phthal	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
di-n-Octylphthalate	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(b)Fluoranthene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(k)Fluoranthene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(a)Pyrene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Indeno(1,2,3-cd)Pyrene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Dibenz(a,h)Anthracene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT
Benzo(g,h,i)Perylene	0.044	U	mg/L	EPA 8270	08/28	08/30	MT

===

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

E 1976

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-2
Client Sample ID :LAY-EB02 POINT LAY
Matrix :WATER

5633 B STREET
ANCHORAGE. AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70116
Report Completed :10/06/93
Collected :08/24/93 @ 13:50 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON. 8270: SURROGATE RECOVERY IS BELOW QC LIMITS FOR NITROBENZENE-D5 AND 2-FLUOROBIPHENYL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4356-2
Client Sample ID :LAY-EB02 POINT LAY
Matrix :WATER

p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Methylene Chloride	0.0023		mg/L	EPA 8260	09/02	09/02	MCM
Napthalene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Styrene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Toluene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Trichloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Semivolatile Organics				EPA 8270			
Phenol	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
bis(2-Chloroethyl)ether	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
2-Chlorophenol	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
1,3-Dichlorobenzene	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
1,4-Dichlorobenzene	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
Benzyl Alcohol	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
1,2-Dichlorobenzene	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
2-Methylphenol	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
bis(2-Chloroisopropyl)e	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
4-Methylphenol	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
n-Nitroso-di-n-Propylam	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
Hexachloroethane	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
Nitrobenzene	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
Isophorone	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
2-Nitrophenol	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
2,4-Dimethylphenol	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
Benzoic Acid	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
bis(2-Chloroethoxy)Meth	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
2,4-Dichlorophenol	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
1,2,4-Trichlorobenzene	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
Naphthalene	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
4-Chloroaniline	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
Hexachlorobutadiene	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
4-Chloro-3-Methylphenol	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
2-Methylnaphthalene	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
Hexachlorocyclopentadie	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
2,4,6-Trichlorophenol	0.025	U	mg/L	EPA 8270	08/30	09/06	MTT
2,4,5-Trichlorophenol	0.025	U	mg/L	EPA 8270	08/30	09/06	MT

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-2
Client Sample ID :LAY-EB02 POINT LAY
Matrix :WATER

2-Chloronaphthalene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
2-Nitroaniline	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Dimethylphthalate	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Acenaphthylene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
2,6-Dinitrotoluene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
3-Nitroaniline	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Acenaphthene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dinitrophenol	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Nitrophenol	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Dibenzofuran	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
2,4-Dinitrotoluene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Diethylphthalate	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Chlorophenyl-Phenylet	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Fluorene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Nitroaniline	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
4,6-Dinitro-2-Methylphe	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
n-Nitrosodiphenylamine	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
4-Bromophenyl-Phenyleth	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Hexachlorobenzene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Pentachlorophenol	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Phenanthrene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Anthracene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
-n-Butylphthalate	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
oranthene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Pyrene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Butylbenzylphthalate	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
3,3-Dichlorobenzidine	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(a)Anthracene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Chrysene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
bis(2-Ethylhexyl)Phthal	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
di-n-Octylphthalate	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(b)Fluoranthene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(k)Fluoranthene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(a)Pyrene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Indeno(1,2,3-cd)Pyrene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Dibenz(a,h)Anthracene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Benzo(g,h,i)Perylene	0.025	U	mg/L	EPA 8270		08/30	09/06	MTT
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Calcium	0.41		mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Iron	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-2
Client Sample ID :LAY-EB02 POINT LAY
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Magnesium	0.20	U	mg/L	EPA 6010		09/02	09/06	DLG
Manganese	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Potassium	5.0	U	mg/L	EPA 6010		09/02	09/06	DLG
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Sodium	0.37		mg/L	EPA 6010		09/02	09/06	DLG
Thallium	0.005	U	mg/L	EPA 7841		09/03	09/08	BMW
Vanadium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Zinc	0.050	U	mg/L	EPA 6010		09/15	09/17	DFL
Dissolved Metals Analys	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Calcium	0.20	U	mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	DL
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DL
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Iron	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Magnesium	0.20	U	mg/L	EPA 6010		09/02	09/06	DLG
Manganese	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Potassium	5.0	U	mg/L	EPA 6010		09/02	09/06	DLG
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Sodium	0.40		mg/L	EPA 6010		09/02	09/06	DLG
Thallium	0.005	U	mg/L	EPA 7841		09/03	09/08	BMW
Vanadium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Zinc	0.050	U	mg/L	EPA 6010		09/15	09/17	DFL

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

mlab Ref.# :93.4356-4
Client Sample ID :LAY-EB02 POINT LAY DUPLICATE
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70116
Report Completed :10/06/93
Collected :08/24/93 @ 13:50 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON. 8270: SAMPLE WAS PREPED WITH 4357-2,3 SPIKE AND DUP.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Calcium	0.31		mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Iron	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Magnesium	0.20	U	mg/L	EPA 6010		09/02	09/06	DLG
Manganese	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Potassium	5.0	U	mg/L	EPA 6010		09/02	09/06	DLG
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Sodium	0.39		mg/L	EPA 6010		09/02	09/06	DLG
Thallium	0.005	U	mg/L	EPA 7841		09/03	09/08	BMW
Vanadium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Zinc	---		mg/L	EPA 6010				
Dissolved Metals Analys	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Calcium	0.20	U	mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4356-4
Client Sample ID :LAY-EB02 POINT LAY DUPLICATE
Matrix :WATER

Copper	0.050	U	mg/L	EPA 6010	09/02	09/06	DLG
Iron	0.10	U	mg/L	EPA 6010	09/02	09/06	DLG
Lead	0.10	U	mg/L	EPA 6010	09/02	09/06	DLG
Magnesium	0.20	U	mg/L	EPA 6010	09/02	09/06	DLG
Manganese	0.050	U	mg/L	EPA 6010	09/02	09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010	09/02	09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010	09/02	09/06	DLG
Potassium	5.0	U	mg/L	EPA 6010	09/02	09/06	DLG
Selenium	0.10	U	mg/L	EPA 6010	09/02	09/06	DLG
Silver	0.050	U	mg/L	EPA 6010	09/02	09/06	DLG
Sodium	0.40		mg/L	EPA 6010	09/02	09/06	DLG
Thallium	0.005	U	mg/L	EPA 7841	09/03	09/08	BMW
Vanadium	0.050	U	mg/L	EPA 6010	09/02	09/06	DLG
Zinc	---		mg/L	EPA 6010			

===

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4356-3
Client Sample ID :LAY-EB02 POINT LAY SPIKE
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70116
Report Completed :10/06/93
Collected :08/24/93 @ 13:50 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By : Steph C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.021		mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chlorobenzene	0.021		mg/L	EPA 8260		09/02	09/02	MCM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethene	0.020		mg/L	EPA 8260		09/02	09/02	MCM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4356-3
Client Sample ID :LAY-EB02 POINT LAY SPIKE
Matrix :WATER

Methylene Chloride	0.0025		mg/L	EPA 8260		09/02	09/02	MCM
Napthalene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Propylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Styrene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Toluene	0.021		mg/L	EPA 8260		09/02	09/02	MCM
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Trichloroethene	0.019		mg/L	EPA 8260		09/02	09/02	MCM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
p+m-Xylene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
o-Xylene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Total Metals Analysis	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	1.06		mg/L	EPA 6010		09/02	09/06	D[illegible]
Antimony	0.87		mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.89		mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.98		mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.38		mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.46		mg/L	EPA 6010		09/02	09/06	DLG
Calcium	9.24		mg/L	EPA 6010		09/02	09/06	DLG
Chromium	0.96		mg/L	EPA 6010		09/02	09/06	DLG
Cobalt	0.93		mg/L	EPA 6010		09/02	09/06	DLG
Copper	0.99		mg/L	EPA 6010		09/02	09/06	DLG
Iron	0.94		mg/L	EPA 6010		09/02	09/06	DLG
Lead	0.89		mg/L	EPA 6010		09/02	09/06	DLG
Magnesium	9.2		mg/L	EPA 6010		09/02	09/06	DLG
Manganese	0.98		mg/L	EPA 6010		09/02	09/06	DLG
Molybdenum	0.94		mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.93		mg/L	EPA 6010		09/02	09/06	DLG
Potassium	9.0		mg/L	EPA 6010		09/02	09/06	DLG
Selenium	0.88		mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.13		mg/L	EPA 6010		09/02	09/06	DLG
Sodium	9.38		mg/L	EPA 6010		09/02	09/06	DLG
Thallium	0.0175		mg/L	EPA 7841		09/03	09/08	BMW
Vanadium	0.92		mg/L	EPA 6010		09/02	09/06	DLG
Zinc	---		mg/L	EPA 6010				
Dissolved Metals Analys	---			-				
ICP Screen, ICF				EPA	n/a			
Aluminum	1.04		mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.88		mg/L	EPA 6010		09/02	09/06	D[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-3
Client Sample ID :LAY-EB02 POINT LAY SPIKE
Matrix :WATER

Arsenic	0.91	mg/L	EPA 6010	09/02	09/06	DLG
Barium	1.00	mg/L	EPA 6010	09/02	09/06	DLG
Beryllium	0.39	mg/L	EPA 6010	09/02	09/06	DLG
Cadmium	0.48	mg/L	EPA 6010	09/02	09/06	DLG
Calcium	9.4	mg/L	EPA 6010	09/02	09/06	DLG
Chromium	0.98	mg/L	EPA 6010	09/02	09/06	DLG
Cobalt	0.95	mg/L	EPA 6010	09/02	09/06	DLG
Copper	0.98	mg/L	EPA 6010	09/02	09/06	DLG
Iron	0.96	mg/L	EPA 6010	09/02	09/06	DLG
Lead	0.91	mg/L	EPA 6010	09/02	09/06	DLG
Magnesium	9.0	mg/L	EPA 6010	09/02	09/06	DLG
Manganese	1.00	mg/L	EPA 6010	09/02	09/06	DLG
Molybdenum	0.97	mg/L	EPA 6010	09/02	09/06	DLG
Nickel	0.95	mg/L	EPA 6010	09/02	09/06	DLG
Potassium	8.3	mg/L	EPA 6010	09/02	09/06	DLG
Selenium	0.88	mg/L	EPA 6010	09/02	09/06	DLG
Silver	0.094	mg/L	EPA 6010	09/02	09/06	DLG
Sodium	8.72	mg/L	EPA 6010	09/02	09/06	DLG
Thallium	0.0185	mg/L	EPA 7841	09/03	09/08	BMW
Vanadium	0.94	mg/L	EPA 6010	09/02	09/06	DLG
Zinc	---	mg/L	EPA 6010			

* See Special Instructions Above
See Sample Remarks Above
Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4356-16
Client Sample ID :LAY-EB02 POINT LAY SPIKE DUPLICATE
Matrix :WATER

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70116
Ordered By	:RAY MORRIS	Report Completed	:10/06/93
Project Name	:DEW LINE RI/FS	Collected	:08/24/93 @ 13:50 hrs.
Project#	:41096-412-01	Received	:08/26/93 @ 12:00 hrs.
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	:

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.021		mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
Chlorobenzene	0.020		mg/L	EPA 8260		09/02	09/02	MC
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethane	0.019		mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethene	0.0019		mg/L	EPA 8260		09/02	09/02	MCM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

CE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

mlab Ref.# :93.4356-16
Client Sample ID :LAY-EB02 POINT LAY SPIKE DUPLICATE
Matrix :WATER

Methylene Chloride	0.0025		mg/L	EPA 8260	09/02	09/02	MCM
Napthalene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Styrene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Toluene	0.021		mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Trichloroethene	0.019		mg/L	EPA 8260	09/02	09/02	MCM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM

===

* See Special Instructions Above
See Sample Remarks Above
Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-17
Client Sample ID :LAY-EB03
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :SHERI K ACE
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70792
Report Completed :10/01/93
Collected :09/07/93 @ 18:00 hrs
Received :09/09/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : C. Vanestead

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA.**THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Qualifier / Comments

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromoform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloromethane	0.0031	B	mg/L	EPA 8260	(U) -E.1	09/20	09/20	KWM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
12Dibromo3Chloropropane	**		mg/L	EPA 8260	(R) -C.1			
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
cis-1,2-Dichloroethene	0.0046		mg/L	EPA 8260		09/20	09/20	KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM

CO
2-3-94

SINCE 1908

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4692-17
Client Sample ID :LAY-EB03
Matrix :WATER

Qualifiers/Comments

Hexachlorobutadiene	**		mg/L	EPA 8260	(R)-C.1			
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Methylene Chloride	0.0034		mg/L	EPA 8260		09/20	09/20	KWM
Napthalene	**		mg/L	EPA 8260	(R)-C.1			
n-Propylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Styrene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Toluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2,3-Trichlorobenzene	**		mg/L	EPA 8260	(R)-C.1			
1,2,4-Trichlorobenzene	**		mg/L	EPA 8260	(R)-C.1			
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Trichloroethene	0.0017		mg/L	EPA 8260		09/20	09/20	KWM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
p+m-Xylene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
o-Xylene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM

2-7-94
ag

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-1
Client Sample ID :LAY-TB01 POINT LAY
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70060
Report Completed :09/20/93
Collected :08/23/93 @ 10:00 hrs
Received :08/25/93 @ 12:00 hrs
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	[illegible]
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	[illegible]
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	[illegible]
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	[illegible]

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4328-1
Client Sample ID :LAY-TB01 POINT LAY
Matrix :WATER

Methylene Chloride	0.012		mg/L	EPA 8260	09/02	09/02	KWM
Napthalene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Styrene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Toluene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Trichloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	KWM

* See Special Instructions Above
See Sample Remarks Above
= Undetected. Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.4356-1
Client Sample ID :LAY-TB02 POINT LAY
Matrix :WATER

Client Name :ICF KAISER ENGINEERING
Ordered By :RAY MORRIS
Project Name :DEW LINE RI/FS
Project# :41096-412-01
PWSID :UA

WORK Order :70116
Report Completed :10/06/93
Collected :08/24/93 @ 08:00 hrs.
Received :08/26/93 @ 12:00 hrs.
Technical Director:STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromodichloromethane	**0.0027**		mg/L	EPA 8260		09/02	09/02	MCM
Bromoform	**0.0042**		mg/L	EPA 8260		09/02	09/02	MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	M
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	M
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroform	**0.0025**		mg/L	EPA 8260		09/02	09/02	MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromochloromethane	**0.0040**		mg/L	EPA 8260		09/02	09/02	MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	M

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-1
Client Sample ID :LAY-TB02 POINT LAY
Matrix :WATER

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Methylene Chloride	0.012		mg/L	EPA 8260	09/02	09/02	MCM
Napthalene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Styrene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Toluene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Trichloroethene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/02	09/02	MCM

* See Special Instructions Above
* See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-16
Client Sample ID :LAY-TB03
Matrix :WATER

Client Name	:ICF KAISER ENGINEERING	WORK Order	:70792
Ordered By	:SHERI K ACE	Report Completed	:10/01/93
Project Name	:DEW LINE RI/FS	Collected	:09/07/93 @ 10:00 hrs
Project#	:41096-412-01	Received	:09/09/93 @ 12:00 hrs
PWSID	:UA	Technical Director	:STEPHEN C. EDE
		Released By	: C. Vonertesl

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA.**THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Parameter	Results	QC Qual	Units	Method	Qualifiers/Comments Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromoform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloromethane	0.0031	B	mg/L	EPA 8260	(U) - E.1	09/20	09/20	KWM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
12Dibromo3Chloropropane	**		mg/L	EPA 8260	(R) - C.1			
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
cis-1,2-Dichloroethene	0.0015		mg/L	EPA 8260		09/20	09/20	KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM

OB
7-3-94

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Qualifier/Comments

Chemlab Ref.# :93.4692-16
Client Sample ID :LAY-TB03
Matrix :WATER

Hexachlorobutadiene	**		mg/L	EPA 8260 (R)-C.1			
Isopropylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Methylene Chloride	0.0028		mg/L	EPA 8260	09/20	09/20	KWM
Napthalene	**		mg/L	EPA 8260 (R)-C.1			
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Styrene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1122-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Tetrachloroethene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Toluene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichlorobenzene	**		mg/L	EPA 8260 (R)-C.1			
1,2,4-Trichlorobenzene	**		mg/L	EPA 8260 (R)-C.1			
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Trichloroethene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
p+m-Xylene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM
o-Xylene	0.0010	U	mg/L	EPA 8260	09/20	09/20	KWM

2/7/94
cos

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

ICF ID	LAY-EB01	LAY-EB01	LAY-EB02	LAY-EB02
F&BI Number	443	446	557	572
Sample Type	water	water	water	water
Date Received	8/24/93	8/24/93	8/25/93	8/25/93
% Dry Weight				
Sequence Date		#5-08/25/93	#5-08/27/93	
Leaded Gas				
JP-4		<1000	<1000	
Lube Oil		<2000	<2000	
Diesel		<1000	<1000	
Spike Level				
Unknown Semi-volatile				
Pentacosane		100	88	
Sequence Date		#5-08/25/93	#5-08/27/93	
PCB 1221		<2	<2	
PCB 1232		<2	<2	
PCB 1016		<2	<2	
PCB 1242		<2	<2	
PCB 1248		<2	<2	
PCB 1254		<2	<2	
PCB 1260		<2	<2	
Spike Level				
Dibutyl Chlorendate		91	88	
Sequence Date		#5-08/25/93	#5-08/27/93	
alpha-BHC		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
beta-BHC		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
gamma-BHC		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
delta-BHC		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
Heptachlor		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
Aldrin		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
Heptachlor Epoxide		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
Endosulfan I		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
DDE		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
Dieldrin		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
Endrin		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
Endosulfan II		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
DDD		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
Endrin Aldehyde		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
DDT		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
Endosulfan Sulfate		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
Endrin Ketone		~~<2~~ <0.2 J	~~<2~~ <0.2 J	
Methoxy Chlor		<10 J	~~<20~~ <10 J	
Chlordane		<50 J	~~<50~~ <10 J	
Dibutyl Chlorendate		91	88	
Spike Level				
Vol Sequence	#3&4-08/24/93			#3&4-08/25/93
CCl4	<1			<1
TCA	<1			<1
Benzene	<1			<1
TCE	<1			<1
Toluene	<1			<1
PCE	<1			<1
Ethylbenzene	<1			<1
Xylenes	<2			<2
Gasoline	<50 J			~~<50~~ <100 J
Spike level				
BFB	88			116

RJB
6-14-95

ICF ID	LAY-TB01	LAY-TB02
F&BI Number	441	569
Sample Type	water	water
Date Received	8/24/93	8/25/93
% Dry Weight		
Sequence Date		
Leaded Gas		
JP-4		
Lube Oil		
Diesel		
Spike Level		
Unknown Semi-volatile		
Pentacosane		
Sequence Date		
PCB 1221		
PCB 1232		
PCB 1016		
PCB 1242		
PCB 1248		
PCB 1254		
PCB 1260		
Spike Level		
Dibutyl Chlorendate		
Sequence Date		
alpha-BHC		
beta-BHC		
gamma-BHC		
delta-BHC		
Heptachlor		
Aldrin		
Heptachlor Epoxide		
Endosulfan I		
DDE		
Dieldrin		
Endrin		
Endosulfan II		
DDD		
Endrin Aldehyde		
DDT		
Endosulfan Sulfate		
Endrin Ketone		
Methoxy Chlor		
Chlordane		
Dibutyl Chlorendate		
Spike Level		
Vol Sequence	#3&4-08/24/93	#3&4-08/25/93
CCl4	<1	<1
TCA	<1	<1
Benzene	<1	<1
TCE	<1	<1
Toluene	<1	<1
PCE	<1	<1
Ethylbenzene	<1	<1
Xylenes	<2	<2
Gasoline	~~≤50~~ <50 J	~~≤50~~ <100 J
Spike level		
BFB	103	102

RJB
6-14-95

APPENDIX G

DATA VALIDATION SUMMARIES

ICF KAISER
ENGINEERS

ICF Kaiser Engineers, Inc.
1800 Harrison Street
P.O. Box 23210
Oakland, California 94612-3430
510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM:	Elmendorf AFB RI/FS/Point Lay (ICF Project No. 41096-412-02)
LABORATORY:	Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER:	Cynthia Schlag, ICF Kaiser Engineers
ANALYSIS:	Extractable Petroleum Hydrocarbons by USEPA Method 8100M
MATRIX:	Soil
DATE:	April 14, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (Anchorage, AK) received four (4) soil samples for extractable petroleum hydrocarbons (EPH) analyses by modified USEPA Method 8100 on September 7, 1993. The samples were extracted on September 14, 1993 and analyzed for EPH by gas chromatography with flame ionization detection (GC/FID) on September 17, 20 and 21, 1993.

The ICF site identification numbers and corresponding Commercial Testing & Engineering Co. sample identification numbers are listed below.

ICF Site No.	Lab Sample No.
LAY-AOC4-2SD05	93.4692-06
LAY-AOC5-2S08	93.4693-01
LAY-SS06-2SD07	93.4693-13
LAY-SS06-2S12	93.4693-14

There were no QC sample designations included in project documentation.

Soil sample results and quantitation limits were reported by the laboratory with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "National Functional Guidelines for Organic Data Review." (December 1990), modified USEPA SW-846 Method 8100 and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

A. Technical Holding Times:
A.1 Technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:
B.1 All QC criteria for the initial calibration were met and the results are considered acceptable.

C. Continuing Calibration:
C.1 All QC criteria for the continuing calibration were met and the results are considered acceptable.

D. Laboratory Blanks:
D.1 The target analytes were not detected in the method blank at concentrations above the Practical Quantitation Limits (PQL) and the results are considered acceptable.

E. Surrogate Recoveries:
E.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

F. Field Blanks:
F.1 There was no field blank designation included in project sample analyses.

G. Laboratory Control Sample Analysis:
G.1 Laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

H. Laboratory Replicate Analysis:
H.1 No laboratory replicate control sample is included with the project documentation.

I. Field Duplicate Analysis:
I.1 No field duplicate analysis is included with the project documentation.

J. Matrix Spike/Matrix Spike Duplicate Analysis:
J.1 The matrix spike (MS) and matrix spike duplicate (MSD) analyses did not meet the QC criteria as noted below.

Sample No.	Recovery	QC Limits
LAY-LF01-2SD13 MS	0%	50-140%
LAY-LF01-S2D13 MSD	0%	50-140%
LAY-AOC5-2S08 MS	1100%	50-140%
LAY-AOC5-2S08 MSD	2294%	50-140%

Although EPH spikes were not recovered for sample number LAY-LF01-S2D13 MS/MSD, the surrogate recoveries were within acceptable limits. According to USEPA guidelines, organic data are not qualified based on MS/MSD recoveries alone. It is the opinion of the reviewer that the above noted recoveries are due to matrix interferences and affect the quality of the data is not known.

K. Quantitation and Identification:

K.1 The chromatographic pattern of samples LAY-AOC4-2SD05, LAY-SS06-2SD07 and LAY-SS06-2S12 is not consistent with the chromatographic pattern of middle distillate fuel (diesel fuel). It is the opinion of the reviewer that peaks found in the above noted samples are due to the presence of higher molecular weight hydrocarbons. Therefore, the detected results for EPH in these samples are considered as estimated (J) and are usable for limited purposes (see modified sample data sheets).

K.2 No other problems were observed with analyte quantitation and identification for all project sample analysis.

L. Conclusion:

L.1 Due to the inconsistency of the chromatographic pattern with the diesel fuel standard, select data are considered as estimates and usable for limited purposes only.

L.2 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
1800 HARRISON STREET
P.O. BOX 23210
OAKLAND, CALIFORNIA 94612-3430
510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM:	Elmendorf AFB/Point Lay RI/FS (ICF Project No.41096-412-02)
LABORATORY:	Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER:	Cynthia E. Schlag
ANALYSIS:	Volatile Petroleum Hydrocarbons by USEPA Method 8015M
MATRIX:	Soil
DATE:	February 7, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received four (4) soil samples for Volatile Petroleum Hydrocarbons (VPH) analysis by USEPA Method 8015M (modified) on September 7, 1993. The samples were analyzed for VPH by gas chromatography with flame ionization detection (GC/FID) on September 15 and 18, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.
LAY-AOC4-2SD05	93.4692-06
LAY-AOC5-2S08	93.4693-01
LAY-SS06-2SD07	93.4693-13
LAY-SS06-2S12	93.4693-14

There were no QC sample designations included in project documentation.

It should be noted, that all quantitation limits reported by the laboratory for project soil samples were higher than those specified in the Project Sampling and Analysis Plan for USEPA Method 8015M. According to the laboratory, all soil samples were extracted in methanol before analysis as required by State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

The analytical results for project soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared according to the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Method 8015M (VPH analysis) and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 Technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 All QC criteria for the initial calibration were met and the results are considered acceptable.

C. Continuing Calibrations:

C.1 All QC criteria for the continuing calibration were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 The target analyte was not detected in the method blanks at a concentration above the practical quantitation limit (PQL) and the results are considered acceptable.

E. Field Blanks:

E.1 No field blank analysis is included in project documentation.

F. Laboratory Control Sample Analysis:

F.1 The laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

G. Field Duplicate Analysis:

G.1 No field duplicate analysis is included in the project documentation.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate Analyses:

I.1 The matrix spike (MS) and matrix spike duplicate (MSD) analyses associated with these samples met all applicable QC criteria and the results are considered acceptable.

J. Internal Standards:

J.1 Internal standard areas for all sample analyses were within specified QC criteria and the results are considered acceptable.

K. Quantitation and Identification:

K.1 No other problems were observed with sample quantitation and identification in project sample analysis.

L. Conclusion:

L.1 All data are considered valid and usable for all purposes.

ICF KAISER
ENGINEERS

ICF Kaiser Engineers, Inc.
1800 Harrison Street
P.O. Box 23210
Oakland, California 94612-3430
510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM:	Dewline/Point Lay RI/FS (ICF Project No.41096-412-02)
LABORATORY:	Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER:	Cynthia Schlag, ICF Kaiser Engineers
ANALYSIS:	Volatile Organic Compounds by USEPA Method 8260
MATRIX:	Water and Soil
DATE:	April 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (Anchorage, AK) received ten (10) soils and twelve (12) water samples for volatile organic compounds (VOC) analyses by USEPA Method 8260 on August 23, 24, and September 7, 1993. The samples were analyzed for VOCs by gas chromatography/mass spectrometry (GC/MS) on September 2, 3, 5, 13, 20, 28, and October 1, 1993.

The ICF site identification numbers and corresponding Commercial Testing & Engineering Co. sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC5-SD01	93.4327-01	Soil
LAY-AOC5-S06	93.4327-02	Soil
LAY-BKGD-SD01	93.4327-05	Soil
LAY-BKGD-S01	93.4327-06	Soil
LAY-TB01	93.4328-01	Water
LAY-EB01	93.4328-02	Water
LAY-BKGD-SW01	93.4328-05	Water
LAY-SS06-S03	93.4354-04	Soil
LAY-LF01-SD04	93.4354-06	Soil
LAY-TB02	93.4356-01	Water
LAY-EB02	93.4356-02	Water
LAY-AB01	93.4356-05	Water
LAY-AOC5-SW01	93.4356-06	Water
LAY-LF01-SW04	93.4356-10	Water
LAY-LF01-SW08	93.4356-11	Water
LAY-SS06-SW02	93.4356-12	Water
LAY-AOC4-2SD05	93.4692-06	Soil
LAY-TB03	93.4692-16	Water
LAY-EB03	93.4692-17	Water
LAY-AOC5-2S08	93.4693-01	Soil

LAY-SS06-2SD07	93.4693-13	Soil
LAY-SS06-2S12	93.4693-14	Soil

The following QC sample designations were included in project documentation: sample numbers LAY-TB01, LAY-TB02 and LAY-TB03 were designated as "trip blanks;" sample numbers LAY-EB01, LAY-EB02 and LAY-EB03 were designated as "equipment blanks;" sample number LAY-AB01 was designated as an "ambient blank;" sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were designated as a "field duplicate pair."

Soil sample results and quantitation limits were reported by the laboratory with an adjustment for moisture content.

Laboratory reports for matrix spike (MS) and matrix spike duplicate (MSD) analyses associated with some project samples were not included with the data package. Therefore, the corresponding ICF sample numbers could not be determined and the laboratory sample numbers were referenced in comment K.1 instead.

It should be noted, that all quantitation limits reported by the laboratory for project soil samples were higher than those specified in the Project Sampling and Analysis Plan for USEPA Method 8260. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA SW-846 Method 8260, and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

A. Technical Holding Times:

A.1 Sample numbers LAY-SS06-S03, LAY-LF01-SD04, LAY-A0C4-2SD05, LAY-AOC5-2S08, LAY-SS06-2SD07, and LAY-SS06-2S12 exceeded the technical holding time criteria of 14 days as noted below.

Sample No.	Date Collected	Date Analyzed	Days Exceeded
LAY-AOC5-2SD08	09/07/93	10/01/93	10
LAY-SS06-2SD07	09/07/93	10/01/93	10
LAY-SS06-2S12	09/07/93	10/01/93	10
LAY-AOC4-2SD05	09/07/93	09/28/93	7
LAY-SS06-S03	08/24/93	09/13/93	6
LAY-LF01-SD04	08/24/93	09/13/93	6

The quantitation limits and detected results for the above noted samples are considered as estimates (J) and usable for limited purposes only (see modified sample data sheets).

A.2 Technical holding time QC criteria were met for all other project sample analyses.

B. GC/MS Instrument Performance Check:

B.1 All QC criteria for the bromofluorobenzene (BFB) tunes were met and the results are considered acceptable.

C. Initial Calibration:

C.1 Due to no relative response factors (RRFs) for the initial calibration dated 09/20/93, the following quantitation limits for the analytes noted below are considered rejected (R) and unusable for any purpose (see modified sample data sheets).

- 1,2-dibromo-3-chloropropane, 1,2,4-trichlrobenzene, 1,2,3-trichlorobenzene, napthalene, and hexachlorobutadiene in sample numbers LAY-TB03 and LAY-EB03

C.2 All other QC criteria for the initial calibration were met and the results are considered acceptable.

D. Continuing Calibration:

D.1 The percent differences (%Ds) in the continuing calibrations exceeded the $<\pm 25\%$ QC validation criteria. The detected results and quantitation limits for the analytes listed in Table A are considered estimated (J) and usable for limited purposes only (see modified sample data sheets and Table A).

%Ds exceeding the $<\pm 25\%$ QC validation criteria were observed for several analytes in the continuing calibrations performed on September 20 and 28, 1993. These deviations are not expected to affect the quality of the results, except for those listed in Table A.

E. Laboratory Blanks:

E.1 Chloromethane was detected in the method blank at a concentration of 1.03 mg/L. Due to method blank contamination, the results reported for chloromethane in sample numbers LAY-TB03 and LAY-EB03 are considered as nondetected (U) (see modified sample data sheets).

E.1 No other target analytes were detected in the method blank at concentrations above the Practical Quantitation Limits (PQLs) and the results are considered acceptable.

F. Surrogate Recoveries:

F.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

G. Field Blanks:

G.1 The following target analytes were detected in the field blanks listed below at concentrations above the PQL:

Sample No.	Analyte	Concentration
LAY-TB03	cis-1,2-dichloroethene	0.0015 mg/L
LAY-TB03	methylene chloride	0.0028 mg/L
LAY-TB03	chloromethane	0.0031 mg/L
LAY-EB03	cis-1,2-dichloroethene	0.0046 mg/L
LAY-EB03	methylene chloride	0.0034 mg/L
LAY-EB03	chloromethane	0.0031 mg/L
LAY-TB02	bromodichloromethane	0.0027 mg/L
LAY-TB02	bromoform	0.0042 mg/L
LAY-TB02	chloroform	0.0025 mg/L
LAY-TB02	dibromochloromethane	0.0040 mg/L
LAY-TB02	methylene chloride	0.0120 mg/L
LAY-EB02	methylene chloride	0.0023 mg/L
LAY-AB01	methylene chloride	0.0031 mg/L

Due to equipment blank contamination, the results reported for methylene chloride in sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 are considered as nondetected (U) (see modified sample data sheets).

G.2 No other target analytes were detected in the field blanks at concentrations above the PQLs and the results are considered acceptable.

H. Laboratory Control Sample Analysis:

H.1 Laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

I. Laboratory Replicate Analysis:

I.1 No laboratory replicate analysis was included with the project documentation.

J. Field Duplicate Analysis:

J.1 A QC limit for precision of $\leq$20%, as measured by the Relative Percent Difference (RPD) between sample values, was specified for field duplicate comparability.

Sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were utilized for the field duplicate analysis. The RPD for napthalene is 100%, exceeding the acceptable QC limits. Due to the substantial difference in the napthalene values, the detected result for napthalene in sample number LAY-LF01-SW08 and the quantitation limit in sample number LAY-LF01-SW04 are considered estimated (J) and usable for limited purposes only (see modified sample data sheets).

K. Matrix Spike/Matrix Spike Duplicate Analysis:

K.1 The recoveries of 1,1-dichloroethane in the matrix spike (MS) and matrix spike duplicate (MSD) analyses associated with all the soil samples did not meet the laboratory established QC limits as noted below.

Sample No.	% Recovery	QC Limits
LAY-LF01-2SD13 MS	20	80-120%
LAY-LF01-2SD13 MSD	17	80-120%
LAY-LF01-SD04 MS	64	80-120%
LAY-LF01-SD04 MSD	66	80-120%
93.4727-02	21	80-120%
93.4727-03	24	80-120%

According to USEPA data validation guidelines, organic data are not qualified based on MS/MSD QC outliers alone. It is the opinion of the reviewer that the low recoveries in these samples are due to sample matrix interferences, and the affect on the quality of the data is not known.

K.2 The laboratory inappropriately used an equipment blank for MS/MSD analyses associated with sample numbers LAY-TB02, LAY-EB02, LAY-AB01, LAY-AOC5-SW01, LAY-LF01-SW08, LAY-SS06-SW02, and LAY-LF01-SW04. Therefore, the accuracy and precision for the project samples based on a project sample matrix cannot be determined.

L. Internal Standards:

L.1 The internal standard areas (I.S.A.) for sample number LAY-AOC5-SD01 did not meet the QC criteria, as noted below.

LAY-AOC5-SD01 I.S.A.	I.S.A. Acceptable Range
50781	65949-263796
46708	57047-228188
33095	35625-142498

Due to low internal standard areas for the above noted sample, all results and quantitation limits for above noted sample are considered estimated (J) and usable for limited purposes only (see modified sample data sheets).

L.2 Internal standard areas for all other sample analyses were within specified QC criteria and the results are considered acceptable.

M. Quantitation and Identification:

M.1 No problems were observed with analyte quantitation and identification in project sample analyses.

N. Conclusion:

N.1 Due to deficiencies in the initial calibration, select data are considered rejected and unusable for any purpose.

N.2 Due to deficiencies in the continuing calibrations, field duplicate analyses, internal standard areas, and exceeded technical holding times, select data are considered estimated and usable for limited purposes only.

N.3 Due to method and field blank contamination, select data are considered non-detected.

N.4 All other data are considered valid and usable for all purposes.

TABLE A CALIBRATIONS OUTSIDE %D CRITERIA			
Date	Compound	%D	Samples
Continuing Calibration - September 20, 1993	chloromethane bromofluorobenzene bromobenzene 1,2,3-trichloropropane n-propylbenzene 2-chlorotoluene 4-chlorotoluene 1,3,5-trimethylbenzene	-99.6 39.3 26.8 28.2 30.0 27.7 29.4 26.6	blank(aq) LAY-TB03 LAY-EB03
Continuing Calibration - September 28, 1993	chloromethane vinyl chloride chloroethane	29.5 29.0 26.2	LAY-AOC4-2SD05

ICF KAISER ENGINEERS

ICF Kaiser Engineers, Inc.
1800 Harrison Street
P.O. Box 23210
Oakland, California 94612-3430
510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM:	Dewline/RI/FS/Point Lay (ICF Project No. 41096-412-02)
LABORATORY:	Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER:	Cynthia Schlag, ICF Kaiser Engineers
ANALYSIS:	Semivolatile Organic Compounds by USEPA Method 8270
MATRIX:	Soil and Water
DATE:	April 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (Anchorage, AK) received nine (9) soil samples and five (5) water samples for semivolatile organic compound (SVOC) analyses by USEPA Method 8270 on August 23, 24, and September 7, 1993. The water samples were extracted on August 30, and September 1, 1993 and analyzed for SVOCs by gas chromatography/mass spectrometry (GC/MS) on September 4 through 7, 1993. The soil samples were extracted on September 6 and 17, 1993 and analyzed for SVOCs by GC/MS on September 22, 30, and October 1 and 26, 1993.

The ICF site identification numbers and corresponding Commercial Testing & Engineering Co. sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC5-SD01	93.4327-01	Soil
LAY-AOC5-S06	93.4327-02	Soil
LAY-BKGD-SD01	93.4327-05	Soil
LAY-BKGD-S01	93.4327-06	Soil
LAY-BKDG-SW01	93.4329-01	Water
LAY-AOC5-SW01	93.4354-01	Water
LAY-SS06-S03	93.4354-04	Soil
LAY-LF01-SD04	93.4354-06	Water
LAY-SS06-SW02	93.4354-10	Soil
LAY-LF01-SW04	93.4358-01	Water
LAY-LF01-SW08	93.4358-04	Water
LAY-AOC5-2S08	93.4693-01	Soil
LAY-SS06-2SD07	93.4693-13	Soil
LAY-SS06-2S12	93.4693-14	Soil

The following QC sample designations were included in project documentation: sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were designated as a "field duplicate pair."

Soil sample results and quantitation limits were reported by the laboratory with an adjustment for moisture content.

Sample number LAY-A0C5-2S08 was not analyzed by the laboratory because the sample was not recovered during extraction. Therefore, the results for this sample were not submitted and were not validated.

Laboratory reports for matrix spike (MS) and matrix spike duplicate (MSD) analyses associated with some project samples were not included with the data package. Therefore, the corresponding ICF sample numbers could not be determined and the laboratory sample numbers were referenced in comments F.2 and K.1 instead.

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA SW-846 Method 8270, and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

A. Technical Holding Times:

A.1 Sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 exceeded the extraction technical holding time criteria of 7 days by one day and it is the opinion of the reviewer that this will not affect data quality.

A.2 Technical holding time QC criteria were met for all other project sample analyses.

B. GC/MS Instrument Performance Check:

B.1 All QC criteria for the decafluorotriphenylphosphine (DFTPP) tunes were met and the results are considered acceptable.

C. Initial Calibration:

C.1 All QC criteria for the initial calibration were met and the results are considered acceptable.

D. Continuing Calibration:

D.1 The percent differences (%Ds) in the continuing calibrations exceeded the $\leq \pm 25\%$ QC validation criteria for several analytes in the continuing calibrations performed on August 30, September 4, 6, and October 23 and 26, 1993. The detected results and quantitation limits for the analytes listed on Table A are considered estimated (J) and usable for limited purposes only (see modified sample data sheets and Table A).

E. Laboratory Blanks:

E.1 Target analyte di-n-butylphthalate was detected in the soil method blanks listed at concentrations above the Practical Quantitation Limit (PQL):

Date extracted	Analyte	Concentration
09/06/93	di-n-butylphthalate	0.20 mg/Kg
09/17/93	di-n-butylphthalate	2.31 mg/Kg

Due to method blank contamination, the result reported for di-n-butylphthalate in sample numbers LAY-LF01-SD04, LAY-SS06-2SD07, and LAY-SS06-2S12 are considered non-detected (U) (see modified sample data sheets).

E.2 Due to laboratory contamination, the result reported for bis(2-ethylhexyl)phthalate in sample number LAY-LF01-SD04 is considered non-detected (U) (see modified sample data sheets). Although not detected in the laboratory method blank, bis(2-ethylhexyl)phthalate has historically been recognized as a common laboratory contaminant. It is the opinion of the reviewer that the bis(2-ethylhexyl)phthalate reported in the sample noted above is an artifact.

E.3 No other target analytes were detected in the method blanks at concentrations above the PQL and the results are considered acceptable.

F. Surrogate Recoveries:

F.1 All surrogate recoveries for the laboratory soil method blank extracted on 09/17/93 were below the 10% QC validation criteria. Therefore, the quantitation limits for all target analytes are considered rejected (R) and unusable for any purpose (see modified sample data sheets).

F.2 The following percent surrogate recoveries, listed below, for sample numbers 93.4258-02 MS, 93.4728-02 MS, 93.4728-03 MSD LAY-AOC5-SD01, LAY-AOC5-S06, LAY-AOC5-S06 MS and LAY-AOC5-S06 MSD were outside the method QC limits.

Sample No.	Analyte	Recovery	QC criteria
93.4258-02 MS	2-fluorobiphenyl	37%	43-116%
93.4258-02 MS	2-fluorophenol	19%	21-100%
93.4728-02 MS	phenol-d6	114%	24-113%
93.4728-03 MSD	nitrobenzene-d5	144%	23-120%
93.4728-02 MS	2-fluorobiphenyl	190%	30-115%
93.4728-03 MSD	2-fluorobiphenyl	181%	30-115%
93.4728-02 MS	2,4,6-tribromophenol	140%	19-122%
93.4728-03 MSD	2,4,6-tribromophenol	126%	19-122%
93.4728-02 MS	terphenyl-d14	179%	18-137%
93.4728-03 MSD	terphenyl-d14	163%	18-137%
LAY-AOC5-SD01	2,4,6-tribromophenol	124%	19-122%
LAY-AOC5-S06	2,4,6-tribromophenol	125%	19-122%
LAY-AOC5-S06 MS	2,4,6-tribromophenol	127%	19-122%
LAY-AOC5-S06 MSD	2-fluorophenol	15%	25-121%

Due to the above listed surrogate recovery problems, the following detected results are considered estimated (J) and usable for limited purposes only (see modified sample data sheets):

- di-n-butylphthalate in sample numbers LAY-SS06-2SD07 and LAY-SS06-2S12

F.3 All other surrogate recoveries met applicable QC criteria and the results are considered acceptable.

G. Field Blanks:

G.1 No field blank analysis were included with the project documentation.

H. Laboratory Control Sample Analysis:

H.1 Laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

I. Laboratory Replicate Analysis:

I.1 No laboratory replicate analysis is included with the project documentation.

J. Field Duplicate Analysis:

J.1 A QC limits for precision of $\leq$20%, as measured by the Relative Percent Difference (RPD) between sample values, was specified for field duplicate comparability.

Sample number LAY-LF01-SW04 and LAY-LF01-SW08 were utilized for the field duplicate analysis. The results of the field duplicate analysis met all applicable QC criteria and the results are considered acceptable.

K. Matrix Spike/Matrix Spike Duplicate Analysis:

K.1 The MS/MSD recoveries in sample numbers 93.4258-02 MS, 93.4258-03 MSD, 93.4728-02 MS, 93.4728-03 MSD, LAY-AOC5-S06 MS and LAY-AOC5-SO6 MSD did not meet the QC criteria as noted below.

Sample No.	Compound	Recovery	QC Limits
93.4258-02 MS	1,2,4-trichlorobenzene	39%	52-115%
93.4258-02 MS	acenapthene	45%	23-134%
93.4258-02 MS	pentachlorophenol	12%	14-176%
93.4258-03 MSD	pentachlorophenol	11%	14-176%
93.4728-02 MS	di-n-butylphthalate	313%	1 -118%
93.4728-03 MSD	di-n-butylphthalate	289%	1 -118%
LAY-AOC5-S06 MS	2,4-dinitrotoluene	99%	28- 89%
LAY-AOC5-S06 MS	pentachlorophenol	143%	17-109%
LAY-AOC5-S06 MSD	2-chlorophenol	22%	25-102%
LAY-AOC5-S06 MSD	1,4-dichlorobenzene	17%	28-104%
LAY-AOC5-S06 MSD	n-nitroso-di-n-propylamine	31%	41-126%
LAY-AOC5-S06 MSD	1,2,4-trichlorobenzene	28%	38-107%

According to USEPA guidelines, organic data are not qualified based on MS/MSD recoveries alone. It is the opinion of the reviewer that the recoveries in these samples are due to sample matrix interferences and the affect on the quality of the data is not known.

K.2 All other MS and MSD analyses met the QC criteria and are considered acceptable.

L. Internal Standards:

L.1 Internal standard areas for all analyses met applicable QC criteria and the results are considered acceptable.

M. Quantitation and Identification:

M.1 No problems were observed with analyte quantitation and identification in project sample analyses.

N. Conclusion:

N.1 Due to the above noted low surrogate recoveries, select data are considered rejected and unusable for any purposes.

N.2 Due to the above noted deficiencies in continuing calibration performance and surrogate recoveries, select data are considered as estimates and usable for limited purposes only.

N.3 Due to the above noted laboratory blank contamination, select data are considered non-detected.

N.4 All other data are considered valid and usable for all purposes.

TABLE A CALIBRATIONS OUTSIDE %D CRITERIA			
Date	Compound	%D	Samples
Continuing Calibration - August 30, 1993	3,3'-dichlorobenzidine	40.6	blank(aq)
Continuing Calibration - September 4, 1993	3,3'-dichlorobenzidine	29.5	LAY-BKGD-SW01
Continuing Calibration - September 6, 1993	hexachlorocyclopentadiene 3,3'-dichlorobenzidine	26.7 29.4	blank(aq) LAY-A0C5-SW01
Continuing Calibration - October 23, 1993	benzo(b)fluoranthene benzo(a)pyrene dibenz(a,h)anthracene	27.8 26.7 27.2	blank(soil)
Continuing Calibration - October 26, 1993	benzoic acid hexachlorobenzene pentachlorophenol dibenz(a,h)anthracene benzo(g,h,i)perylene	28.5 27.5 28.2 28.6 28.6	LAY-SS06-2SD07 LAY-SS06-2S12

ICF KAISER ENGINEERS

ICF Kaiser Engineers, Inc.
1800 Harrison Street
P.O. Box 23210
Oakland, California 94612-3430
510/419-6000

DATA VALIDATION REPORT

PROGRAM: Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)
LABORATORY: Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER: Sharon Lin, ICF Kaiser Engineers, Inc.
ANALYSIS: Total Organic Carbon by USEPA Method 9060
MATRIX: Water
DATE: February 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received one (1) water sample for Total Organic Carbon (TOC) analysis by USEPA Method 9060 on August 25, 1993. The sample was analyzed for TOC on September 7, 1993.

The ICF site identification number and corresponding CT&E laboratory sample identification number are listed below.

ICF Site No.	Lab Sample No.
LAY-BKGD-SW01	4328-5

The analytical result is presented on the sample data sheet submitted by the laboratory (definitions of the data qualifiers are listed in Table 1B). This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 9060 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:
A.1 All technical holding time criteria were met for project sample analyses.

B. Initial Calibrations:
B.1 Initial calibration QC criteria were met for all project sample analyses and the results are considered acceptable.

C. Continuing Calibrations:

C.1 Continuing calibration QC criteria were met for all project sample analyses and the results are considered acceptable.

D. Laboratory Blanks:

D.1 TOC was not detected in the method blank at a concentration above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

E. Field Blanks:

E.1 No field blanks were included in the project documentation.

F. Laboratory Control Sample (LCS) Analysis:

F.1 The laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

G. Laboratory Replicate Analysis:

G.1 Laboratory replicate analyses submitted with project data met all applicable QC criteria for precision as measured by Relative Percent Difference (RPD) and the results are considered acceptable.

H. Field Duplicate Analysis:

H.1 No field duplicates were included in the project documentation.

I. Matrix Spike:

I.1 The matrix spike (MS) recovery for the project sample was 72%, falling below the advisory QC criteria of 75-125%. It is the opinion of the reviewer that the above noted deviation is due to matrix interferences and this should be noted.

J. Quantitation:

J.1 No problems were encountered with sample quantitation and the results are considered acceptable.

K. Conclusion:

K.1 All data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF Kaiser Engineers, Inc.
1800 Harrison Street
P.O. Box 23210
Oakland, California 94612-3430
510/419-6000

DATA VALIDATION REPORT

PROGRAM: Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)
LABORATORY: Commercial Testing & Engineering Co. & Twiss Analytical (Anchorage, AK)
REVIEWER: Sharon Lin, ICF Kaiser Engineers, Inc.
ANALYSIS: Total Organic Carbon by USEPA Method 9060
MATRIX: Soil
DATE: February 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received two (2) soil samples for Total Organic Carbon (TOC) analysis by USEPA Method 9060 on August 25, 1993. The samples were analyzed by Twiss Analytical for TOC on September 20, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.
LAY-BKGD-SD01	4327-5
LAY-BKGD-S01	4327-6

The analytical results are presented on the sample data sheets submitted by the laboratory (definitions of the data qualifiers are listed in Table 1B). This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 9060 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 All technical holding time criteria were met for project sample analyses.

B. Initial Calibrations:

B.1 The laboratory did not use a multi-level calibration standards to quantitate results for the soil samples, as specified in the USEPA Method 9060. However, the single point calibration standard used was within a reasonable range for accurate quantitation. Therefore, it is the opinion of the reviewer that the quality of the data is not affected and the results are considered acceptable.

C. Laboratory Blanks:

C.1 TOC was not detected in the method blank at a concentration above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

D. Field Blanks:

D.1 No field blanks were included in the project documentation.

E. Laboratory Control Sample (LCS) Analysis:

E.1 The laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

F. Laboratory Replicate Analysis:

F.1 Laboratory replicate analyses submitted with project data met all applicable QC criteria for precision as measured by Relative Percent Difference (RPD) and the results are considered acceptable.

G. Field Duplicate Analysis:

G.1 No field duplicates were included in the project documentation.

H. Matrix Spike:

H.1 No matrix spike (MS) recovery analysis was required for this method.

I. Quantitation:

I.1 Although a single point calibration standard was used to quantitate sample results, the quality of the data are not affected and the results are considered acceptable.

K. Conclusion:

K.1 All data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF Kaiser Engineers, Inc.
1800 Harrison Street
P.O. Box 23210
Oakland, California 94612-3430
510/419-6000

DATA VALIDATION REPORT

PROGRAM:	Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)
LABORATORY:	Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER:	Cynthia Schlag
ANALYSIS:	Total Organic Carbon by USEPA Method 9060
MATRIX:	Water and Soil
DATE:	February 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received three (3) water samples and one (1) soil sample for Total Organic Carbon (TOC) analysis by USEPA Method 9060 on August 24, 1993. The water samples were analyzed by CT&E and the soil sample was analyzed by Twiss Analytical for TOC on September 7 and 21, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC5-SW01	93.4354-01	Water
LAT-LF01-SD04	93.4354-06	Soil
LAY-LF01-SW04	93.4358-01	Water
LAY-LF01-SW08	93.4358-06	Water

The following QC sample designation was included in project documentation: sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were designated as a "field duplicate pair."

Soil sample results and quantitation limits were reported by the laboratory with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis" (October 1989), USEPA Method 9060 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 Technical holding time QC criteria were met for all project samples.

B. Initial Calibrations:

B.1 The laboratory did not use multi-level calibration standards to quantitate values for the soil samples, as specified by the method. However, the single-point calibration standard used was within a reasonable range for accurate quantitation. Therefore, it is the opinion of the reviewer that the quality of the data is not affected and the results are considered acceptable.

B.2 All initial calibration criteria were met for all project water sample analyses and the results are considered acceptable.

C. Laboratory Blanks:

C.1 The target analyte was not detected in the method blanks at a concentration above the practical quantitation limit (PQL) and the results are considered acceptable.

D. Field Blanks:

D.1 The target analyte was not detected in the equipment blank at a concentration above the PQL and the results are considered acceptable.

E. Laboratory Control Sample Analysis:

E.1 The laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

F. Laboratory Replicate Analysis:

F.1 No laboratory replicate analysis is included with project documentation.

G. Field Duplicate Analysis:

G.1 A QC limit for precision of $\leq$20%, as measured by the Relative Percent Difference (RPD) between sample values, was specified for field duplicate comparability.

Sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were utilized for the field duplicate analysis. The results of the field duplicate analysis met all applicable QC criteria and the results are considered acceptable.

H. Matrix Spike:

H.1 The water matrix spike recovery met all applicable QC criteria and the results are considered acceptable.

H.2 No soil matrix spike analysis is included in project documentation, therefore, the quality of the data cannot be determined.

I. Quantitation:

I.1 Although a single-point calibration standard was used to quantitate sample results, the quality of the data are not affected and the results are considered acceptable.

I.2 No problems were encountered with sample quantitation and the results are considered acceptable.

J. Conclusion:

J.1 All data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
1800 HARRISON STREET
P.O. BOX 23210
OAKLAND, CALIFORNIA 94612-3430
510/419-6000

DATA VALIDATION REPORT

PROGRAM: Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)
LABORATORY: Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER: Sharon Lin, ICF Kaiser Engineers, Inc.
ANALYSIS: Total Dissolved Solids by USEPA Method 160.1
MATRIX: Water
DATE: February 2, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received one (1) water sample for Total Dissolved Solids (TDS) analysis by USEPA Method 160.1 on August 26, 1993. The sample was analyzed for TDS on September 2, 1993.

The ICF site identification number and corresponding CT&E laboratory sample identification number are listed below.

ICF Site No.	Lab Sample No.
LAY-AOC5-SW01	4354-1

The analytical result with qualifications is presented on the sample data sheet submitted by the laboratory. Definitions of data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 160.1 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The project sample was collected on August 24, 1993 and analyzed for TDS on September 2, 1993, exceeding the technical holding time QC criteria of seven (7) days by two (2) days. Therefore, the detected sample result in the above noted sample is considered an estimate (J) and usable for limited purposes only (see modified sample data sheet)

B. Calibration:

B.1 The percent recovery for the calibration verification standard (CVS) was 118%, marginally exceeding the advisory QC criteria of 83-117%. It is the opinion of the reviewer that the above noted deviation will not affect the quality of the data.

B.2 All other applicable QC criteria were met for sample calibration analyses and the results are considered acceptable.

C. Laboratory Blanks:

C.1 TDS was not detected in the method blank associated with the sample at a concentration above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

D. Field Blanks:

D.1 There were no field blank analyses associated with the project sample.

E. Laboratory Replicate Analyses:

E.1 Laboratory replicate analyses submitted with project data met all applicable QC criteria for precision as measured by Relative Percent Difference (RPD) and the results are considered acceptable.

F. Field Duplicate Analysis:

F.1 There were no field duplicate analyses associated with the project sample.

G. Quantitation:

G.1 No problems were encountered with sample quantitation.

H. Conclusion:

H.1 Due to the exceeded holding time, the sample result is considered estimated and usable for limited purposes only.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
1800 HARRISON STREET
P.O. BOX 23210
OAKLAND, CALIFORNIA 94612-3430
510/419-6000

DATA VALIDATION REPORT

PROGRAM:	Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)
LABORATORY:	Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER:	Sharon Lin, ICF Kaiser Engineers, Inc.
ANALYSIS:	Total Dissolved Solids by USEPA Method 160.1
MATRIX:	Water
DATE:	February 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received one (1) water sample for Total Dissolved Solids (TDS) analysis by USEPA Method 160.1 on August 26, 1993. The sample was analyzed for TDS on September 2, 1993.

The ICF site identification number and corresponding CT&E laboratory sample identification number are listed below.

ICF Site No.	Lab Sample No.
LAY-LF01-SW08	4358-4

The analytical result with qualifications is presented on the sample data sheet submitted by the laboratory. Definitions of data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 160.1 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The project sample was collected on August 24, 1993 and analyzed for TDS on September 2, 1993, exceeding the technical holding time QC criteria of seven (7) days by two (2) days. Therefore, the detected sample result in the above noted sample is considered an estimate (J) and usable for limited purposes only (see modified sample data sheet).

B. Calibration:

B.1 All applicable QC criteria were met for sample calibration analyses and the results are considered acceptable.

C. Laboratory Blanks:

C.1 TDS was not detected in the method blank associated with the sample at a concentration above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

D. Field Blanks:

D.1 There were no field blank analyses associated with the project sample.

E. Laboratory replicate Analyses:

E.1 Laboratory replicate analyses submitted with project data met all applicable QC criteria for precision as measured by Relative Percent Difference (RPD) and the results are considered acceptable.

F. Field Duplicate Analysis:

F.1 There were no field duplicate analyses associated with the project sample.

G. Quantitation:

G.1 No problems were encountered with sample quantitation.

H. Conclusion:

H.1 Due to the exceeded holding time, the sample result is considered an estimate and usable for limited purposes only.

ICF KAISER ENGINEERS

ICF Kaiser Engineers, Inc.
1800 Harrison Street
P.O. Box 23210
Oakland, California 94612-3430
510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM:	Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)
LABORATORY:	Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER:	Sharon Lin, ICF Kaiser Engineers, Inc.
ANALYSIS:	Total Suspended Solids by USEPA Method 160.2
MATRIX:	Water
DATE:	February 3, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received one (1) water sample for Total Suspended Solids (TSS) analysis by USEPA Method 160.2 on August 26, 1993. The sample was analyzed for TSS on August 31, 1993.

The ICF site identification number and corresponding CT&E laboratory sample identification number are listed below.

ICF Site No.	Lab Sample No.
LAY-AOC5-SW01	4354-1

The analytical result is presented on the sample data sheet submitted by the laboratory (definitions of data qualifiers are listed in Table 1B). This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 160.2 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:
A.1 All technical holding time QC criteria were met for project sample analyses.

B. Calibration:
B.1 Method calibration is not a requirement for USEPA Method 160.2.

C. Laboratory Blanks:

C.1 TSS was not detected in the method blank associated with the sample at a concentration above the practical quantitation limit (PQL) and the results are considered acceptable.

D. Field Blanks:

D.1 There were no field blanks analyses associated with the project sample.

E. Laboratory Replicate Analyses:

E.1 Laboratory replicate analyses submitted with project data met all applicable QC criteria for precision as measured by Relative Percent Difference (RPD) and the results are considered acceptable.

F. Field Duplicate Analyses:

F.1 There were no field duplicate analyses associated with the project sample.

G. Quantitation:

G.1 The TSS result in sample number LAY-AOC5-SW01 was reported to be 2.4 mg/L on the associated sample data sheet. The true value should be 23.5 mg/L according to the raw data submitted by the laboratory. This transcription error should be noted (see modified sample data sheet).

G.2 No other problems were encountered with sample quantitation.

H. Conclusion:

H.1 All data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF Kaiser Engineers, Inc.
1800 Harrison Street
P.O. Box 23210
Oakland, California 94612-3430
510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM: Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)
LABORATORY: Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER: Sharon Lin, ICF Kaiser Engineers, Inc.
ANALYSIS: Total Suspended Solids by USEPA Method 160.2
MATRIX: Water
DATE: February 3, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received one (1) water sample for Total Suspended Solids (TSS) analysis by USEPA Method 160.2 on August 24, 1993. The sample was analyzed for TSS on August 31, 1993.

The ICF site identification number and corresponding CT&E laboratory sample identification number are listed below.

ICF Site No.	Lab Sample No.
LAY-LF01-SW08	4358-4

The analytical result is presented on the sample data sheet submitted by the laboratory (definitions of data qualifiers are listed in Table 1B). This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 160.2 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:
A.1 All technical holding time QC criteria were met for project sample analyses.

B. Calibration:
B.1 Method calibration is not a requirement for USEPA Method 160.2.

C. Laboratory Blanks:

C.1 TSS was not detected in the method blank associated with the sample at a concentration above the practical quantitation limit (PQL) and the results are considered acceptable.

D. Field Blanks:

D.1 There were no field blank analyses associated with the project sample.

E. Laboratory Replicate Analyses:

E.1 Laboratory replicate analyses submitted with project data met all applicable QC criteria for precision as measured by Relative Percent Difference (RPD) and the results are considered acceptable.

F. Field Duplicate Analyses:

F.1 There were no field duplicate analyses associated with the project sample.

G. Quantitation:

G.1 No problems were encountered with sample quantitation.

H. Conclusion:

H.1 All data are considered valid and usable for all purposes.

TABLE 1B
DATA QUALIFIERS

NO QUALIFIERS indicates that the data are acceptable both qualitatively and quantitatively.

U Indicates that the compound is not present above the concentration listed.

L Indicates results which fall between the Instrument Detection Limit for waters or the Method Detection Limit for soils and the Practical Quantitation Limit. Results are considered estimates and are usable for limited purposes.

J Results are considered estimates and are usable for <u>limited</u> purposes.

R Results are rejected and data are <u>unusable</u> for any purpose.

ICF KAISER
ENGINEERS

ICF Kaiser Engineers, Inc.
1800 Harrison Street
P.O. Box 23210
Oakland, California 94612-3430
510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM:	Dewline/Point Lay RI/FS (ICF Project No. 41096-412-02)
LABORATORY:	Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER:	Sharon Lin, ICF Kaiser Engineers, Inc.
ANALYSIS:	Total and Dissolved Metals by USEPA Method 6010 Total and Dissoved Thallium by USEPA Method 7841
MATRIX:	Water
DATE:	April 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received two (2) water samples for total and dissolved metals and thallium analyses by USEPA Methods 6010 and 7841 on August 26, 1993. The samples were digested on September 2 and 15, 1993 and were analyzed for total and dissolved metals by inductively coupled plasma atomic emission spectroscopy (ICP) and for total and dissolved thallium by atomic absorption furnace technique (GFAA) on September 6 through 17, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.
LAY-LF01-SW08	93.4358-04
LAY-SS06-SW02	93.4358-05
LAY-LF01-SW08 (F)	93.4358-04
LAY-SS06-SW02 (F)	93.4358-05

Sample numbers LAY-LF01-SW08 (F) and LAY-SS06-SW02 (F) were designated as field filtered samples and analyzed for dissolved metals and thallium.

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 6010, USEPA Method 7841, and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

A. Technical Holding Times:

A.1 Technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 All initial calibration QC criteria were met for project sample analyses and the results are considered acceptable.

C. Continuing Calibrations:

C.1 All continuing calibration QC criteria were met for project sample analyses and the results are considered acceptable.

D. Laboratory Blank Analyses:

D.1 No target analytes were detected in the laboratory and calibration blanks (initial and continuing calibration blanks) above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

E. Field Blanks:

E.1 No field blank analyses were included with the project documentation.

F. Field Duplicate Analysis:

F.1 No field duplicate analyses were included with the project documentation.

G. Laboratory Replicate Analysis:

G.1 No laboratory replicate analysis was included with the project documentation.

H. ICP Interference Check Sample (ICS) Analyses:

H.1 All QC criteria were met for the ICS analyses and the results are considered acceptable.

I. Laboratory Control Sample (LCS) Analyses:

I.1 All QC criteria were met for the LCS analyses and the results are considered acceptable.

J. Matrix Spike (MS) Analysis:

J.1 Sample number LAY-LF01-SW04 was utilized for the MS analysis. The MS recovery for total and dissolved silver in the above MS sample were 44% and 43%, respectively, below the QC limits of 75-125%. Therefore, all nondetected results for silver in all project samples are considered as estimates (J) and usable for limited purposes only (see modified sample data sheets). The above noted nondetected results may be false negatives.

J.2 The MS recoveries for total and dissolved iron were outside the advisory QC limits. However, the sample concentration exceeded the spike concentration by a factor of four or more for the above noted target analyte. Therefore, data are not qualified on the basis of the deviations in MS recoveries.

J.3 Due to above noted deviations in MS recoveries, post-digestion spike recovery analyses were performed on September 6, 1993. The recovery results for all post-digestion spike analyses met applicable QC criteria.

J.4 All other applicable QC criteria were met for the MS analyses and the results are considered acceptable.

K. Quantitation:

K.1 No problems were observed with analyte quantitation in project sample analyses.

L. Conclusion:

L.1 Due to above noted deficiencies in matrix spike analyses, select data are considered estimated and usable for limited purposes only.

L.2 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF Kaiser Engineers, Inc.
1800 Harrison Street
P.O. Box 23210
Oakland, California 94612-3430
510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM:	Dewline/Point Lay RI/FS (ICF Project No. 41096-412-02)
LABORATORY:	Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER:	Sharon Lin, ICF Kaiser Engineers, Inc.
ANALYSIS:	Total and Dissolved Metals by USEPA Method 6010 Total and Dissoved Thallium by USEPA Method 7841
MATRIX:	Water
DATE:	April 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received two (2) water samples for total and dissolved metals and thallium analyses by USEPA Methods 6010 and 7841 on August 25, 1993. The samples were digested on September 2 and 15, 1993 and were analyzed for total and dissolved metals by inductively coupled plasma atomic emission spectroscopy (ICP) and for total and dissolved thallium by atomic absorption furnace technique (GFAA) on September 3 through 17, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.
LAY-EB01	93.4328-02
LAY-BKGD-SW01	93.4328-05
LAY-BKGD-SW01 (F)	93.4328-05

Sample number LAY-EB01 was designated as an "equipment blank."

Sample numbers LAY-BKGD-SW01 (F) was designated as a field filtered sample and analyzed for dissolved metals and thallium.

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 6010, USEPA Method 7841, and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

A. Technical Holding Times:

A.1 Technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 All initial calibration QC criteria were met for project sample analyses and the results are considered acceptable.

C. Continuing Calibrations:

C.1 All continuing calibration QC criteria were met for project sample analyses and the results are considered acceptable.

D. Laboratory Blank Analyses:

D.1 No target analytes were detected in the laboratory and calibration blanks (initial and continuing calibration blanks) above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

E. Field Blanks:

E.1 No target analytes were detected at concentrations above the PQL in the field blank analyses and the results are considered acceptable.

F. Field Duplicate Analysis:

F.1 No field duplicate analyses were included with the project documentation.

G. Laboratory Replicate Analysis:

G.1 No laboratory replicate analysis was included with the project documentation.

H. ICP Interference Check Sample (ICS) Analyses:

H.1 All QC criteria were met for the ICS analyses and the results are considered acceptable.

I. Laboratory Control Sample (LCS) Analyses:

I.1 All QC criteria were met for the LCS analyses and the results are considered acceptable.

J. Matrix Spike (MS) Analysis:

J.1 Sample number LAY-BKGD-SW01 was utilized for the MS analysis. The MS recovery for total and dissolved silver in the above MS sample were 66% and 67%, respectively, below the QC limits of 75-125%. Therefore, all nondetected results for silver in all project samples are considered as estimates (J) and usable for limited purposes only (see modified sample data sheets). The above noted nondetected results may be false negatives.

J.2 Due to above noted deviations in MS recoveries, post-digestion spike recovery analyses were performed on September 6, 1993. The recovery results for all post-digestion spike analyses met applicable QC criteria.

J.3 All other applicable QC criteria were met for the MS analyses and the results are considered acceptable.

K. Quantitation:

K.1 No problems were observed with analyte quantitation in project sample analyses.

K.2 The sample result for the target analyte magnesium in sample number LAY-BKGD-SW01 was reported incorrectly, as nondetected (U) on the sample data sheet submitted by the laboratory. This transcription error has been corrected and this should be noted (see modified sample data sheet).

L. Conclusion:

L.1 Due to above noted deficiencies in matrix spike analyses, select data are considered estimated and usable for limited purposes only.

L.2 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
1800 HARRISON STREET
P.O. BOX 23210
OAKLAND, CALIFORNIA 94612-3430
510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM: Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)
LABORATORY: Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER: Sharon Lin, ICF Kaiser Engineers, Inc.
ANALYSIS: Total & Dissolved Metals by USEPA Method 6010 & Total & Dissolved Thallium by USEPA Method 7841
MATRIX: Soil & Water
DATE: February 3, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received two (2) soil samples for total metals analyses and one (1) water sample for total and dissolved metals analyses by USEPA Methods 6010 and 7841 on August 26, 1993. The samples were digested on August 30 through September 15, 1993 and analyzed for total and dissolved metals by inductively coupled plasma atomic emission spectroscopy (ICP) and for total and dissolved thallium by atomic absorption furnace technique (GFAA) on August 30 through September 17, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC5-SW01	4354-1	Water
LAY-AOC5-SW01 (F)	4354-1	Water
LAY-SS06-S03	4354-4	Soil
LAY-LF01-SD04	4354-6	Soil

Sample number LAY-AOC5-SW01 (F) was designated as a field-filtered sample and analyzed for dissolved metals and thallium.

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 6010, USEPA Method 7841, and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

A. Technical Holding Times:
A.1 Technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:
B.1 Initial calibration QC criteria were met for project sample analyses and the results are considered acceptable.

C. Continuing Calibrations:
C.1 Continuing calibration QC criteria were met for project sample analyses and the results are considered acceptable.

D. Laboratory Blank Analyses:
D.1 No target analytes were detected in the method and calibration blanks (initial and continuing calibration blanks) above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

E. Field Blanks:
E.1 There were no field blanks analyses included in the project documentation.

F. Field Duplicate Analysis:
F.1 There were no field duplicate analyses included in the project documentation.

G. Laboratory Replicate Analysis:
G.1 There were no laboratory replicate analyses included in the project documentation.

H. ICP Interference Check Sample (ICS) Analyses:
H.1 All applicable QC criteria were met for the ICS analyses and the results are considered acceptable.

I. Laboratory Control Sample (LCS) Analyses:
I.1 All LCS analyses associated with project samples met applicable QC criteria and the results are considered acceptable.

J. Matrix Spike (MS) Analysis:
J.1 Sample number LAY-LF01-SD04 was utilized for MS analyses. The MS recovery for silver in sample number LAY-LF01-SD04-MS was 0%, falling outside the established QC limits of 75-125%. Therefore, all non-detected results for silver in sample numbers LAY-SS06-S03 and LAY-LF01-SD04 are considered rejected (R) and unusable for any purpose (see modified sample data sheets).

J.2 Sample number LAY-AOC5-SW01 (F) was utilized for MS analyses. The MS recovery for silver in sample number LAY-AOC5-SW01(F)-MS was 45%, falling outside the established QC limits of 75-125%. Therefore, the sample result for silver in

sample number LAY-AOC5-SW01 (F) is considered as an estimate (J) and usable for limited purposes only (see modified sample data sheet).

J.3 The recoveries for the following analytes in the MS analyses associated with sample numbers LAY-SS06-S03 and LAY-LF01-SD04 fell outside the advisory QC limits of 75-125%:

Sample number	Analyte	%Recovery	Bias
LAY-LF01-SD04-MS	Antimony	66	Low
LAY-LF01-SD04-MS	Manganese	192	High

Due to above noted deviations in MS recoveries, the above noted sample results are considered as estimates (J) and usable for limited purposes only (see modified sample data sheets).

The non-detected results for antimony in the associated samples may be false-negatives.

The detected results for manganese in the associated samples may be biased high.

J.4 The MS recoveries for aluminum and iron were outside the advisory QC limits. However, the sample concentration exceeded the spike concentration by a factor of four or more for the above noted target analytes. Therefore, data are not qualified on the basis of the deviations in MS recoveries.

J.5 Due to above noted deviations in matrix spike recoveries (see J.1-J.4), post-digestion spike recovery analyses were performed on September 2 and 6, 1993. The recovery results for all post-digestion spike analyses met applicable QC criteria.

J.6 All other applicable QC criteria were met for the matrix spike analyses and the results are considered acceptable.

K. Quantitation:

K.1 No problems were observed with analyte quantitation in project sample analyses.

L. Conclusion:

L.1 Due to above noted deficiencies in matrix spike analyses, select data are considered rejected and unusable for any purpose.

L.2 Due to above noted deficiencies in matrix spike analyses, select data are considered estimates and usable for limited purposes.

L.3 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF Kaiser Engineers, Inc.
1800 Harrison Street
P.O. Box 23210
Oakland, California 94612-3430
510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM:	Dewline/Point Lay RI/FS (ICF Project No. 41096-412-02)
LABORATORY:	Commercial Testing & Engineering Co. (Anchorage, AK)
REVIEWER:	Sharon Lin, ICF Kaiser Engineers, Inc.
ANALYSIS:	Total Metals by USEPA Method 6010 Total Thallium by USEPA Method 7841
MATRIX:	Water
DATE:	April 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received four (4) soil samples for total and dissolved metals and thallium analyses by USEPA Methods 6010 and 7841 on August 25, 1993. The samples were digested on August 30, 1993 and were analyzed for total metals by inductively coupled plasma atomic emission spectroscopy (ICP) and for total thallium by atomic absorption furnace technique (GFAA) on September 1 through 6, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.
LAY-AOC5-SD01	93.4327-01
LAY-AOC5-S06	93.4327-02
LAY-BKGD-SD01	93.4327-05
LAY-BKGD-S01	93.4327-06

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 6010, USEPA Method 7841, and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

A. Technical Holding Times:

A.1 Technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 All initial calibration QC criteria were met for project sample analyses and the results are considered acceptable.

C. Continuing Calibrations:

C.1 All continuing calibration QC criteria were met for project sample analyses and the results are considered acceptable.

D. Laboratory Blank Analyses:

D.1 No target analytes were detected in the laboratory and calibration blanks (initial and continuing calibration blanks) above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

E. Field Blanks:

E.1 No field blank analyses were included with the project documentation.

F. Field Duplicate Analysis:

F.1 No field duplicate analyses were included with the project documentation.

G. Laboratory Replicate Analysis:

G.1 No laboratory replicate analysis was included with the project documentation.

H. ICP Interference Check Sample (ICS) Analyses:

H.1 All QC criteria were met for the ICS analyses and the results are considered acceptable.

I. Laboratory Control Sample (LCS) Analyses:

I.1 All QC criteria were met for the LCS analyses and the results are considered acceptable.

J. Matrix Spike (MS) Analysis:

J.1 Sample number LAY-AOC5-S06 was utilized for the MS analysis. The MS recovery silver was 0%, below the QC limits of 75-125%. Therefore, all nondetected results for silver in all project samples are considered as rejected (R) and unusable for all purposes (see modified sample data sheets).

J.2 MS recoveries for the following analytes were outside the advisory QC limits of 75-125%:

Sample No.	Analyte	%Recovery	Bias
LAY-AOC5-S06 MS	Antimony	66	Low
LAY-AOC5-S06 MS	Manganese	192	High
LAY-AOC5-S06 MS	Selenium	129	High

Due to above deviations in MS recoveries, all nondetected results for antimony, all detected results for manganese and selenium are considered as estimated (J) and usable for limited purposes only (see modified sample data sheets). The nondetected results for antimony in the associated samples may be false negatives and the detected results for manganese and selenium in the associated samples may be biased high.

J.3 The MS recoveries for aluminum and iron were outside the advisory QC limits. However, the sample concentration exceeded the spike concentration by a factor of four or more for the above noted target analytes. Therefore, data are not qualified on the basis of the deviations in MS recoveries.

J.4 Due to above noted deviations in MS recoveries, post-digestion spike recovery analyses were performed on September 2, 1993. The recovery results for all post-digestion spike analyses met applicable QC criteria.

J.5 All other applicable QC criteria were met for the MS analyses and the results are considered acceptable.

K. Quantitation:

K.1 No problems were observed with analyte quantitation in project sample analyses.

L. Conclusion:

L.1 Due to above noted deficiencies in matrix spike analyses, select data are considered rejected and unusable for any purpose.

L.2 Due to above noted deficiencies in matrix spike analyses, select data are considered estimated and usable for limited purposes only.

L.3 All other data are considered valid and usable for all purposes.

ICF KAISER
ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM: POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY: Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER: Clyde Hedin
ANALYSIS: Diesel by EPA Method 8015M
MATRIX: Water
DATE: June 16, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 11 water samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 545) for diesel analysis by the semivolatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for diesel by USEPA Method 8015M (modified) (GC/FID) on August 27, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-EB02	557	Water
LAY-LF01-SW01	559	Water
LAY-LF01-SW02	560	Water
LAY-LF01-SW03	561	Water
LAY-LF01-SW04	562	Water
LAY-LF01-SW05	563	Water
LAY-LF01-SW06	564	Water
LAY-LF01-SW07	565	Water
LAY-LF01-SW08	566	Water
LAY-SS06-SW02	567	Water

The quantitation limits reported by the laboratory for the water samples (1000 ppb) were higher than those specified in the Project Sampling and Analysis Plan (500 ppb). It is the opinion of the reviewer that the quality of the data is not affected.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document " National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8015M, and the Project Sampling and Analysis Plan.

The following QC sample designations were included in project documentation: sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were designated as field duplicates.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory analyzed a 5 point initial calibration on GC instrument ICF5 on 8/25/93. The attempted range of the initial calibration was from 10 ppm to 10,000 ppm. Due to low sensitivity and interference, the 10 ppm calibration standard was deleted from the calibration. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 31.2% was calculated using calibration factors determined from the initial 6 point calibration. The RSD of 31.2% exceeds the recommended QC criteria of 20.0%, possibly due to inconsistent integration techniques employed by the laboratory. Reintegration of the initial calibration standards may reduce the calibration factor %RSD to a value less than what was reported. Since the initial calibration exceeds the recommended QC criteria of 20.0%, the detected results for diesel in the project samples are qualified "J" as estimated and usable for limited purposes.

C. Continuing Calibration:

C.1 The continuing calibration 098F0601 exceeded the acceptable QC criteria due to poor integration techniques. All detected sample results and PQLs associated with this calibration are qualified "J" as estimated and useable for limited purposes.

D. Laboratory Blanks:

D.1 Diesel was not detected in the method blanks at concentrations above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Diesel was not detected in the instrument blanks at concentrations above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted for analysis with this project sample set.

G. Field Replicate Analyses:

G.1 A QC limit for precision of ≤ 20%, as measured by Relative Percent Difference (RPD) between water sample values, was specified for field replicate comparability.

G.2 Samples LAY-LF01-SW04 and LAY-LF01-SW08 were utilized for field duplicate analysis. The results of the field duplicate analyses met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 All project sample surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate:

I.1 Distilled water was spiked, analyzed, and reported by the laboratory for the water matrix spike/matrix spike duplicate analyses for chain of custody 545.

I.2 The matrix spike duplicate recovery and Relative Percent Deviation (RPD) exceeded QC criteria due to poor integration techniques used by the laboratory.

J. System Performance:

J.1 No problems with system performance were observed for all project samples.

K. Quantitation and Identification:

K.1 Surrogate recoveries for the TW matrix spike duplicate exceeded the QC criteria.

K.5 No other problems were observed with compound quantitation and identification.

L. Conclusion:

L.1 Diesel was not detected at concentrations above the PQL in any of the project samples.

L.2 Due to problems with the initial calibration, the detected results for the project samples are qualified "J" as estimated and usable for limited purposes.

L.3 Due to problems with the continuing calibration, the detected results and PQLs for the project samples LAY-LF01-SW07, LAY-LF01-SW08, and LAY-SS06-SW02 are qualified "J" as estimated and usable for limited purposes.

L.4 All other data are considered valid and usable for all purposes.

ICF KAISER
ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM: POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY: Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER: Timothy Vonnahme
ANALYSIS: Diesel by EPA Method 8015M
MATRIX: Soil
DATE: June 1, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 12 soil samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 538) for diesel analysis by the semivolatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for diesel by USEPA Method 8015M (modified) (GC/FID) on August 24, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC5-S01	417	Soil
LAY-AOC5-S02	419	Soil
LAY-AOC5-S03	421	Soil
LAY-AOC5-S04	423	Soil
LAY-AOC5-S05	425	Soil
LAY-AOC5-S06	427	Soil
LAY-AOC5-S07	429	Soil
LAY-BKGD-SD01	431	Soil
LAY-BKGD-S01	433	Soil
LAY-BKGD-S02	435	Soil
LAY-BKGD-S03	437	Soil
LAY-BKGD-S04	439	Soil

The quantitation limits reported by the laboratory for the soil samples (50 ppm) were higher than those specified in the Project Sampling and Analysis Plan (10 ppm). It is the opinion of the reviewer that the quality of the data was not affected.

The following QC sample designations were included in project documentation: sample numbers LAY-AOC5-S01 and LAY-AOC5-S07 were designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document " National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8015M, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory analyzed a 7 point initial calibration on GC instrument ICF5 on August 21, 1993. The attempted range of the initial calibration was from 10 ppm to 10,000 ppm. Due to low sensitivity and interference, the 10 ppm calibration standard was deleted from the calibration. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 12.0% was calculated using calibration factors determined from the initial 6 point calibration. The RSD of 12.0% is within the recommended QC criteria of 20.0%.

C. Continuing Calibration:

C.1 All QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 Diesel was not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Diesel was not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blank analyses associated with this project sample set.

G. Field Replicate Analyses:

G.1 A QC limit for precision of ≤ 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.

G.2 Samples LAY-AOC5-S01 and LAY-AOC5-S07 were utilized for field replicate analysis. The results of the field replicate analyses, as reported by the laboratory, met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 The surrogate recoveries for the following samples, LAY-AOC5-S01, LAY-AOC5-S02, LAY-AOC5-S03, LAY-AOC5-S04, and the QC samples were calculatedd by the reviewer using peak height instead of area due to incorrect peak integrations submitted by the laboratory. The surrogate recoveries using area counts reported by the laboratory for these samples could not be verified by the reviewer. Since both sets of surrogate recoveries met the QC criteria, no action was taken.

H.2 All other surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate:

I.1 Sample number LAY-AOC5-S06 was used as the matrix spike/matrix spike duplicate sample.

I.2 The reviewer could not verify the MS/MSD percent recoveries because the laboratory failed to submit the reintegrated areas. It is not known what affect this will have on the data.

J. System Performance:

J.1 Four of the samples contained biological material reported by the laboratory at concentrations ranging between 40-270 ppm. Carryover did not appear to present a problem between these samples.

J.2 No other problems with system performance were observed for all project samples.

K. Quantitation and Identification:

K.1 Discrepancies exist between the detected amount of diesel reported by the laboratory and the amount of diesel calculated by the reviewer in some of the project samples. Listed below are the results reported by the laboratory and the results regenerated by the reviewer. The results are listed in parts per million (ppm).

ICF Site No.	Laboratory Results	Validation Results
LAY-AOC5-S01	5400	7200
LAY-AOC5-S06	2200	2900
LAY-AOC5-S06 dup	1700	2300
LAY-AOC5-S07	5400	7200

It appears that the laboratory used an incorrect linear regression equation to quantitate the amount of diesel in the samples. The detected results for these samples have been changed on the data summary forms by the reviewer.

K.2 The laboratory reported an incorrect PQL for sample LAY-BKGD-S04. The

PQL has been corrected on the data summary form by the reviewer.

K.3 No other problems were observed with compound quantitation and identification.

L. Conclusion:

L.1 Diesel was detected in samples LAY-AOC5-S01, LAY-AOC5-S06, and LAY-AOC5-S07 at concentrations ranging between 2900 and 7200 ppm, as calculated by the reviewer.

L.2 The laboratory reported an incorrect PQL for sample LAY-BKGD-S04. The PQL has been corrected on the data summary form by the reviewer.

L.3 Surrogate recoveries for samples LAY-AOC5-S01, LAY-AOC5-S02, LAY-AOC5-S03, LAY-AOC5-S04, and the QC samples were calculated by the reviewer using peak height instead of area due to incorrect peak integrations submitted by the laboratory.

L.4 The reviewer could not verify the MS/MSD percent recoveries because the laboratory failed to submit the reintegrated areas. It is not known what affect this will have on the data.

L.5 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM:	POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY:	Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER:	Timothy Vonnahme
ANALYSIS:	Diesel by EPA Method 8015M
MATRIX:	Water and Soil
DATE:	May 25, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 3 soil and 4 water samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 537). Six of the samples were requested for diesel analysis by the semivolatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for diesel by USEPA Method 8015M (modified) (GC/FID) on August 24 and August 25, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-EB-01	446	Water
LAY-BKGD-SW01	457	Water
LAY-BKGD-SW02	462	Water
LAY-AOC5-SD01	463	Soil
LAY-AOC5-SD02	465	Soil
LAY-AOC5-SD03	467	Soil

The following QC sample designations were included in project documentation: sample number LAY-EB-01 was designated as an equipment blank.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The instrument Number-Sequence Date on the data summary form for water samples LAY-EB-01, LAY-BKGD-SW01, and LAY-BKGD-SW02 were inadvertently recorded by the laboratory as ICF5 08-25-93 instead of ICF6 08-23-93.

The quantitation limits reported by the laboratory for the water samples (200 ppb) were lower than those specified in the Project Sampling and Analysis Plan (500 ppb). However, since the low point of the initial calibration is 50 ppm, the PQL should be 1000 ppb. The PQL has been adjusted on the data summary form by the reviewer.

The quantitation limits reported by the laboratory for the soil samples (50 ppm) were higher than those specified in the Project Sampling and Analysis Plan (10 ppm). Since the low point of the initial calibration is 50 ppm, the practical quantitation limit (PQL) should be 50 ppm. It is the opinion of the reviewer that the quality of the data was not affected.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document " National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8015M, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory analyzed a 7 point initial calibration on GC instrument ICF5 on August 21, 1993. The attempted range of the initial calibration was from 10 ppm to 10,000 ppm. Due to low sensitivity and interference, the 10 ppm calibration standard was deleted from the calibration. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 19.1% was calculated using calibration factors determined from the initial 6 point calibration. The RSD of 19.1% is within the recommended QC criteria of 20.0%.

B.2 The laboratory attempted to perform a 6 point initial calibration on GC instrument ICF6 on August 21, 1993. The range of the initial calibration was from 50 ppm to 10,000 ppm. The 500 ppm and the 200 ppm standards were not used due to autosampler injection errors. A percent relative standard deviation (%RSD) of 48.3 was calculated using calibration factors determined from the initial calibration. The %RSD of 48.3% exceeds the recommended QC criteria of 20.0%.

Since the initial calibration was only a 4 point calibration curve, and the %RSD exceeds the recommended criteria, the detected results for diesel in all the water samples are qualified "J" as estimated and usable for limited purposes.

B.3 Due to an increase in sensitivity, a second 3 point initial calibration on GC instrument ICF6 was performed on August 28, 1993. The range of this initial calibration was from 100 ppm to 10,000 ppm. A percent relative standard deviation (%RSD) of 9.07 was calculated using calibration factors determined from the initial

calibration. Since this initial calibration was performed after the samples were analyzed, it can not be used for quantitation of this sample set, but can be used as a reference to explain the increased sensitivity in this sample set.

C. Continuing Calibration:

C.1 All QC criteria for the continuing calibrations were met on both instruments and the results are considered acceptable.

D. Laboratory Blanks:

D.1 Diesel was not detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Diesel was not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 Sample number LAY-EB-01 was designated as an equipment blank.

F.2 Diesel was not detected in the equipment blank at a concentration above the PQL and the results are considered acceptable.

G. Field Replicate Analyses:

G.1 There were no field replicate samples associated with this project sample set.

H. Surrogate Recoveries:

H.1 The laboratory reported incorrect surrogate areas on the quantitation reports for the three soil samples and associated QC sample, resulting in recoveries outside the QC criteria. Since no reintegration of the peak areas were submitted, the reviewer calculated the surrogate recoveries using peak height. All three surrogate recoveries were within the QC criteria. It is the opinion of the reviewer that the quality of the data was not affected.

H.2 All other surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate:

I.1 Sample number LAY-AOC5-S06 was used for the soil matrix spike/matrix spike duplicate analyses. The sample was not included on chain-of-custody 537. The laboratory results for the matrix spike sample and matrix spike duplicate sample could not be verified by the reviewer because the reintregated areas were not submitted by the laboratory. It is the opinion of the reviewer that the quality of the data was not affected.

J. System Performance:

J.1 The laboratory reported diesel in sample LAY-AOC5-SD01 at a concentration of 1500 ppm, and sample LAY-AOC5-SD02 at a concentration of 2800 ppm. It is the opinion of the reviewer that since no instrument blank was analyzed between

these two samples, the diesel detected in sample LAY-AOC5-SD02 is actually carryover from the previous sample. The reported result of 2800 ppm is primarily due to a percent solid of only 7%. Therefore, the PQL in sample number LAY-AOC5-SD02 has been adjusted to compensate for the carryover.

J.2 No other problems with system performance were observed for all project samples.

K. Quantitation and Identification:

K.1 A discrepancy exists between the diesel result of 1500 ppm reported by the laboratory and the result of 1100 ppm regenerated by the reviewer for sample LAY-AOC5-SD01. The discrepancy is probably due to inconsistent quantitation procedures performed by the laboratory. The result has been adjusted on the data summary form by the reviewer.

K.2 Since the low point of the initial calibration was 50 ppm, the PQL for the project water samples were adjusted to 1000 ppb on the data summary forms by the reviewer.

K.3 The laboratory reported a detected result of 2800 ppm for diesel in sample LAY-AOC5-SD02. It is the opinion of the reviewer that since no instrument blank was analyzed between this sample and the previous high level sample, the diesel detected is actually carryover from the previous sample. The reported result of 2800 ppm is primarily due to a percent solid of only 7%. Therefore, the PQL in sample number LAY-AOC5-SD02 has been adjusted to compensate for the carryover.

K.4 The surrogate recoveries for the soil samples and the associated QC sample were calculated by the reviewer using peak height instead of area because the laboratory did not submit the reintegrated surrogate areas. It is the opinion of the reviewer that the quality of the data was not affected.

K.5 No other problems were observed with compound quantitation and identification.

L. Conclusion:

L.1 Diesel was detected in sample LAY-AOC5-SD01 at a concentration of 1100 ppm.

L.2 Diesel was detected by the laboratory in sample LAY-AOC5-SD02 at a concentration of 2800 ppm. It is the opinion of the reviewer that since no instrument blank was analyzed between this sample and the previous high level sample, the diesel detected is actually carryover from the previous sample. Therefore, the PQL in sample number LAY-AOC5-SD02 has been adjusted to compensate for the carryover.

L.3 The PQL for the project water samples were adjusted to 1000 ppb on the data summary forms by the reviewer.

L.4 The PQL for the project water samples were adjusted to 1000 ppb on the data summary forms by the reviewer.

L.5 The results for the matrix spike and matrix spike duplicate samples could not be verified by the reviewer because the laboratory did not submit reintegrated diesel areas for the two QC samples.

L.6 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM:	POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY:	Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER:	Timothy Vonnahme
ANALYSIS:	Diesel by EPA Method 8015M
MATRIX:	Soil
DATE:	June 14, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 15 soil samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 542) for diesel analysis by the semivolatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for diesel by USEPA Method 8015M (modified) (GC/FID) on August 26, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC4-SD01	628	Soil
LAY-AOC4-SD02	630	Soil
LAY-AOC4-SD03	632	Soil
LAY-AOC4-SD04	634	Soil
LAY-SS06-S01	636	Soil
LAY-SS06-S02	638	Soil
LAY-SS06-S03	640	Soil
LAY-SS06-S04	642	Soil
LAY-SS06-S05	644	Soil
LAY-SS06-S06	646	Soil
LAY-SS06-S07	648	Soil
LAY-SS06-S08	650	Soil
LAY-SS06-S09	652	Soil
LAY-SS06-S10	654	Soil
LAY-SS06-S11	656	Soil

The quantitation limits reported by the laboratory for the soil samples (50 ppm) were higher than those specified in the Project Sampling and Analysis Plan (10 ppm). It is the opinion of the reviewer that the quality of the data was not affected.

The following QC sample designation was included in project documentation: sample numbers LAY-SS06-S09 and LAY-SS06-S01 were designated as field replicates, and sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document " National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8015M, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory analyzed a 7 point initial calibration on GC instrument ICF5 on August 25, 1993. The attempted range of the initial calibration was from 10 ppm to 10,000 ppm. Due to low sensitivity and interference, the 10 ppm calibration standard was deleted from the calibration. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 31.2% was calculated using calibration factors determined from the initial 6 point calibration. The %RSD of 31.2% exceeds the recommended QC criteria of 20.0%. Therefore, the detected results for diesel in all project samples are qualified "J" as estimated and usable for limited purposes.

C. Continuing Calibration:

C.1 All QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 Diesel was not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Diesel was not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blank analyses associated with this project sample set.

G. Field Replicate Analyses:

G.1 A QC limit for precision of $\leq$ 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.

G.2 Sample numbers LAY-SS06-S09 and LAY-SS06-S01 were utilized for field replicate analysis. The results of the field replicate analyses met all applicable QC criteria and the results are considered acceptable.

G.3 Sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also utilized for field replicate analysis. The results of the field replicate analyses met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 The surrogate recoveries for the following samples, LAY-SS06-S03, LAY-SS06-S04, LAY-SS06-S08, and LAY-SS06-S11 were calculated by the reviewer using peak height instead of area due to interference present in the sample. The above surrogate percent recoveries met all QC criteria.

H.2 The laboratory did not report surrogate recoveries for samples LAY-SS06-S01, LAY-SS06-S02, and LAY-SS06-S09 due to high levels of interference making surrogate quantitation impossible. Since no surrogate recoveries were obtainable, all detected results or the PQLs for these three samples are qualified "J" as estimated and usable for limited purposes.

H.3 All other surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate:

I.1 Sample number LAY-SS06-S07 was used as the matrix spike/matrix spike duplicate sample.

I.2 Discrepancies exist between the percent recoveries of diesel reported by the laboratory and the percent recovery of diesel as calculated by the reviewer for the following QC samples. Listed below are the results reported by the laboratory and the results regenerated by the reviewer.

ICF Site No.	Laboratory Results	Validation Results
MS	77%	48%
MSD	100%	53%

The validated results calculated by the reviewer were outside the QC criteria. It is not known what affect this will have on the quality of the data.

J. System Performance:

J.1 Carryover did not appear to present a problem between the high level samples. Several instrument blanks were run between the high level samples, eliminating any possible carryover.

J.2 No other problems with system performance were observed for all project samples.

K. Quantitation and Identification:

K.1 Discrepancies exist between the detected amount of diesel reported by the laboratory and the amount of diesel calculated by the reviewer in some of the project samples. Listed below are the results reported by the laboratory and the results regenerated by the reviewer. The results are listed in parts per million (ppm).

ICF Site No.	Laboratory Results	Validation Results
LAY-SS06-S01	25000	23000
LAY-SS06-S02	35000	33400
LAY-SS06-S04	20000	12800
LAY-SS06-S06	45000	62000
LAY-SS06-S08	2500	2600
LAY-SS06-S11	8300	7600

It appears that the laboratory used an incorrect linear regression equation to quantitate the amount of diesel in the samples and in some instances may not have allowed for the moisture content. The detected results for these samples have been adjusted on the data summary forms by the reviewer.

The laboratory reported 20000 ppm of diesel and motor oil for sample LAY-SS06-S04. The reviewer calculated 12800 ppm of diesel without including the motor oil.

K.2 The laboratory did not dilute and reanalyze samples LAY-SS06-S01, LAY-SS06-S02, LAY-SS06-S04, and LAY-SS06-S06 which were outside the linear calibration curve. Therefore, the detected results for diesel in these samples are qualified "J" as estimated and usable for limited purposes.

K.3 The laboratory reported incorrect PQLs for samples LAY-AOC4-SD01, LAY-AOC4-SD03, LAY-AOC4-SD04, LAY-SS06-S03, LAY-SS06-S07, and LAY-SS06-S10. The PQLs have been corrected on the data summary forms by the reviewer.

K.4 The matrix spike and matrix spike duplicate recoveries as calculated by the reviewer were outside the QC criteria. It is not known what affect this will have on the data.

K.5 No other problems were observed with compound quantitation and identification.

L. Conclusion:

L.1 Diesel was detected in select project soil samples. Several of the samples

were contaminated with lube oil, thus making exact quantitation difficult.

L.2 The laboratory did not dilute and reanalyze samples LAY-SS06-S01, LAY-SS06-S02, LAY-SS06-S04, and LAY-SS06-S06 which were outside the linear calibration curve.

L.3 The laboratory reported incorrect PQLs for several of the samples. The PQLs have been corrected on the data summary form by the reviewer.

L.4 Some of the surrogate recoveries were calculated by the reviewer using peak height instead of area due to interference present in the samples, and in select samples the laboratory did not report surrogate recoveries due again to excessive interference present in the samples. Refer to section H.2 for exact sample identification.

L.5 The matrix spike and matrix spike duplicate recoveries as calculated by the reviewer were outside the QC criteria.

L.6 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM: POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY: Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER: Keith Strout
ANALYSIS: Gasoline by USEPA Method 8015M
MATRIX: Soil
DATE: May 25, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (FBI) (Seattle, WA) received 12 soil samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 538) for gasoline analysis by the volatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for gasoline by USEPA Method 8015M (modified) (GC/FID) on August 28, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC5-S01	417	Soil
LAY-AOC5-S02	419	Soil
LAY-AOC5-S03	421	Soil
LAY-AOC5-S04	423	Soil
LAY-AOC5-S05	425	Soil
LAY-AOC5-S06	427	Soil
LAY-AOC5-S07	429	Soil
LAY-BKGD-SD01	431	Soil
LAY-BKGD-S01	433	Soil
LAY-BKGD-S02	435	Soil
LAY-BKGD-S03	437	Soil
LAY-BKGD-S04	439	Soil

The following QC sample designations were included in project documentation: sample numbers LAY-AOC5-S01 and LAY-AOC5-S07 were designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared using the guidelines in the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Method 8015M, and the Project Sampling and Analysis Plan.

It should be noted that all quantitation limits reported by the laboratory for project soil samples were higher than those specified in the Project Sampling and Analysis Plan. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by the State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory analyzed a four point initial calibration on system 3-4 on August 24, 1993. The range of the initial calibration was from 100 ppb to 5000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 27.4 was calculated using calibration factors determined from the initial calibration. The 27.4% RSD exceeds the recommended 20.0% RSD, therefore, the detected results for gasoline in all of the project samples are qualified "J" as estimated and are usable for limited purposes.

C. Continuing Calibrations:

C.1 The laboratory did not perform any continuing calibrations for the gasoline fraction. The laboratory indicated that since the same injection was used to analyze for gasoline and the BTEX compounds, the continuing calibration response on the FID for the BTEX compounds and the surrogate were used to determine linearity for the gasoline fraction. It is the opinion of the reviewer that the laboratory should have run continuing calibrations for the gasoline fraction, however, the response for the BTEX compounds and the surrogate compound can be used to determine if the instrument has maintained linearity for the gasoline fraction. Because the laboratory did not perform any continuing calibrations specifically for the gasoline fraction, the detected results and the practical quantitation limits (PQLs) are qualified "J" as estimated and are usable for limited purposes.

C.2 All QC criteria for the BTEX continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 Gasoline was not detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Gasoline was not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blank analyses associated with this project sample set.

G. Field Replicate Analysis:

G.1 A QC limit for precision of ≤ 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.

G.2 Samples LAY-AOC5-S01 and LAY-AOC5-S07 were utilized for field replicate analysis. The results of the field replicate analyses, as reported by the laboratory, met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate Analyses:

I.1 The laboratory did not perform any matrix spike/matrix spike duplicate analyses for the gasoline fraction.

J. System Performance:

J.1 The laboratory did not perform any instrument blanks between some of the samples which contained high levels of gasoline. It is the opinion of the reviewer that this resulted in carryover causing interference with the quantitation of some of the samples. Therefore, the detected result for gasoline in sample numbers LAY-AOC5-S01 and LAY-AOC5-S07 are qualified "J" as estimated and usable for limited purposes.

J.2 No other problems with system performance were observed for the project sample analyses.

K. Quantitation and Identification:

K.1 The laboratory reported a detected result for gasoline in samples LAY-AOC5-S01, LAY-AOC5-S06, and LAY-AOC5-S07 and indicated that the detected results may be due to diesel fuel. It is the opinion of the reviewer that the detected peaks in sample LAY-AOC5-S06 are probably due to higher molecular weight hydrocarbons, and the detected peaks in samples LAY-AOC5-S01 and LAY-AOC5-S07 are probably due to a combination of higher molecular weight hydrocarbons and carryover from a previous sample. Therefore, the detected results for gasoline

in these samples are qualified "J" as estimated and usable for limited purposes.

K.2 No other problems were observed with compound quantitation and identification.

L. Conclusion:

L.1 Due to the large percent RSD in the initial calibration and the lack of continuing calibrations for the gasoline fraction, the detected results and the PQL for gasoline in all project samples and blanks are qualified "J" as estimated and usable for limited purposes.

L.2 Due to carryover and the presence of higher molecular weight hydrocarbons, the detected results in sample numbers LAY-AOC5-S01, LAY-AOC5-S06, and LAY-AOC5-S07 are qualified "J" as estimated and usable for limited purposes.

ICF KAISER
ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM:	POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY:	Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER:	Keith Strout
ANALYSIS:	Gasoline by USEPA Method 8015M
MATRIX:	Water and Soil
DATE:	May 18, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (FBI) (Seattle, WA) received 3 soil and 4 water samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 537). All of the samples required gasoline analysis by the volatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for gasoline by USEPA Method 8015M (modified) (GC/FID) on August 24 through August 27, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-TB-01	441	Water
LAY-EB-01	443	Water
LAY-BKGD-SW01	448	Water
LAY-BKGD-SW02	461	Water
LAY-AOC5-SD01	463	Soil
LAY-AOC5-SD02	465	Soil
LAY-AOC5-SD03	467	Soil

The following QC sample designations were included in project documentation: sample number LAY-TB-01 was designated as a travel blank and sample number LAY-EB-01 was designated as an equipment blank.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared using the guidelines in the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Method 8015M, and the Project Sampling and Analysis Plan.

It should be noted that all quantitation limits reported by the laboratory for project soil samples were higher than those specified in the Project Sampling and Analysis Plan. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by the State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory analyzed a four point initial calibration on system 1-2 on August 19, 1993. The range of the initial calibration was from 50 ppb to 5000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 31.8 was calculated using calibration factors determined from the initial calibration. The 31.8% RSD exceeds the recommended 20.0% RSD, therefore, the detected results for gasoline in all of the samples analyzed on system 1-2 are qualified "J" as estimated and are usable for limited purposes.

B.2 The laboratory analyzed a four point initial calibration on system 3-4 on August 24, 1993. The range of the initial calibration was from 100 ppb to 5000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 27.4 was calculated using calibration factors determined from the initial calibration. The 27.4% RSD exceeds the recommended 20.0% RSD, therefore, the detected results for gasoline in all of the samples analyzed on system 3-4 are qualified "J" as estimated and are usable for limited purposes.

C. Continuing Calibrations:

C.1 The laboratory did not perform any continuing calibrations for the gasoline fraction. The laboratory indicated that since the same injection was used to analyze for gasoline and the BTEX compounds, the continuing calibration response on the FID for the BTEX compounds and the surrogate were used to determine linearity for the gasoline fraction. It is the opinion of the reviewer that the laboratory should have run continuing calibrations for the gasoline fraction, however, the response for the BTEX compounds and the surrogate compound can be used to determine if the instrument has maintained linearity for the gasoline fraction. Because the laboratory did not perform any continuing calibrations specifically for the gasoline fraction, the detected results and the practical quantitation limits (PQLs) are qualified "J" as

estimated and are usable for limited purposes.

C.2 All QC criteria for the BTEX continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 Gasoline was not detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Gasoline was not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 Sample number LAY-TB-01 was designated as a travel blank and sample number LAY-EB-01 was designated as an equipment blank.

F.2 Gasoline was not detected in the travel blank at a concentration above the PQL and the results are considered acceptable.

F.3 Gasoline was not detected in the equipment blank at a concentration above the PQL and the results are considered acceptable.

G. Field Replicate Analysis:

G.1 There were no field replicate samples associated with this project sample set.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate Analyses:

I.1 The laboratory did not perform any matrix spike/matrix spike duplicate analyses for the gasoline fraction.

J. System Performance:

J.1 No problems with system performance were observed for the project samples.

K. Quantitation and Identification:

K.1 The laboratory reported a detected result for gasoline in sample number LAY-AOC5-SD02. The reported result for gasoline in this sample is from an analysis performed on August 24, 1993 which contained carryover from a previous high level sample. The laboratory reanalyzed this sample on August 27, 1993 and gasoline was not present in the sample at a concentration above the PQL. Therefore, the result for gasoline in sample number LAY-AOC5-SD02 has been changed on the data summary form to reflect that gasoline was not detected at a concentration above the PQL.

K.2 The low point in the gasoline initial calibration performed on August 24, 1993 was 100 ppb. Therefore, the PQL for gasoline in all of the water samples and blanks analyzed on system 3-4 has been raised from 50 ppb to 100 ppb, and the PQL for gasoline in all of the soil samples and blanks analyzed on system 3-4 has been raised from 1 ppm to 2 ppm.

K.3 No other problems were observed with compound quantitation and identification.

L. Conclusion:

L.1 Due to the large percent RSDs in the initial calibrations and the lack of continuing calibrations, the detected results and the PQL for all project samples and blanks are qualified "J" as estimated and usable for limited purposes.

L.2 Due to carryover from a previous sample, the laboratory reanalyzed sample number LAY-AOC5-SD02. However, the laboratory inadvertently reported the results from the contaminated analysis. Therefore, the data summary form has been changed by the reviewer to contain the results from the reanalysis.

L.3 The PQL for gasoline in all samples and blanks analyzed on system 3-4 has been changed to coincide with the low point in the initial calibration performed on August 24, 1993.

ICF KAISER
ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM: POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY: Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER: Keith Strout
ANALYSIS: Gasoline by USEPA Method 8015M
MATRIX: Soil
DATE: May 26, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (FBI) (Seattle, WA) received 15 soil samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 542). All of the samples required gasoline analysis by the volatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for gasoline by USEPA Method 8015M (modified) (GC/FID) on August 26 and August 27, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC4-SD01	628	Soil
LAY-AOC4-SD02	630	Soil
LAY-AOC4-SD03	632	Soil
LAY-AOC4-SD04	634	Soil
LAY-SS06-S01	636	Soil
LAY-SS06-S02	638	Soil
LAY-SS06-S03	640	Soil
LAY-SS06-S04	642	Soil
LAY-SS06-S05	644	Soil
LAY-SS06-S06	646	Soil
LAY-SS06-S07	648	Soil
LAY-SS06-S08	650	Soil

ICF Site No.	Lab Sample No.	Matrix
LAY-SS06-S09	652	Soil
LAY-SS06-S10	654	Soil
LAY-SS06-S11	656	Soil

The following QC sample designation was included in project documentation: sample numbers LAY-SS06-S09 and LAY-SS06-S01 were designated as field replicates, and sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also designated as field replicates.

The analytical results for soils were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared using the guidelines in the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Method 8015M, and the Project Sampling and Analysis Plan.

It should be noted that all quantitation limits reported by the laboratory for project soil samples were higher than those specified in the Project Sampling and Analysis Plan. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by the State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory analyzed a four point initial calibration on system 1-2 on August 19, 1993. The range of the initial calibration was from 50 ppb to 5000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 31.8 was calculated using calibration factors determined from the initial calibration. The 31.8% RSD exceeds the recommended 20.0% RSD, therefore, the detected results for gasoline in all of the samples are qualified "J" as estimated and are usable for limited purposes.

C. Continuing Calibrations:

C.1 The laboratory did not perform any continuing calibrations for the gasoline fraction. The laboratory indicated that since the same injection was used to analyze for gasoline and the BTEX compounds, the continuing calibration response on the FID for the BTEX compounds and the surrogate were used to determine linearity for the gasoline fraction. It is the opinion of the reviewer that the laboratory should have run continuing calibrations for the gasoline fraction, however, the response for the BTEX compounds and the surrogate compound can be used to determine if the instrument has maintained linearity for the gasoline fraction. Because the laboratory

did not perform any continuing calibrations specifically for the gasoline fraction, the detected results and the practical quantitation limits (PQLs) are qualified "J" as estimated and are usable for limited purposes.

C.2 All QC criteria for the BTEX continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 Gasoline was not detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Gasoline was not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted with this project sample set.

G. Field Replicate Analysis:

G.1 A QC limit for precision of ≤ 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.

G.2 Sample numbers LAY-SS06-S09 and LAY-SS06-S01 were utilized for field replicate analysis. The results of the field replicate analyses (70% RPD) exceeded the QC criteria. It is not known what effect, if any, this will have on the quality of the data.

G.3 Sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also utilized for field replicate analysis. The results of the field replicate analyses met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 All of the surrogate QC recovery criteria were met for all project samples and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate Analyses:

I.1 The laboratory did not perform any matrix spike/matrix spike duplicate analyses for the gasoline fraction.

J. System Performance:

J.1 The laboratory did not perform any instrument blanks between some of the samples which contained high levels of gasoline. It is the opinion of the reviewer that this resulted in carryover and created interference causing an elevated baseline in some of the samples which probably did not contain gasoline. Therefore, the PQL in sample numbers LAY-SS06-S03, LAY-SS06-S05, LAY-SS06-S07, LAY-SS06-S08, and LAY-SS06-S10 has been adjusted to compensate for the carryover.

J.2 No other problems with system performance were observed for the project sample analyses.

K. Quantitation and Identification:

K.1 Discrepancies exist between the detected amount of gasoline reported by the laboratory and the amount of gasoline calculated by the reviewer in some of the project samples. Listed below are the results reported by the laboratory and the results regenerated by the reviewer. The results are listed in parts per million (ppm).

ICF Site No.	Laboratory Results	Validation Results
LAY-SS06-S01	34	25
LAY-SS06-S09	71	48
LAY-SS06-S04	570	397
LAY-SS06-S06	500	316
LAY-SS06-S02	780	540
LAY-SS06-S11	220	150

It appears that the laboratory used an incorrect linear regression equation to quantitate the amount of gasoline in the samples. The detected results for these samples have been changed on the data summary forms by the reviewer.

K.2 Because the laboratory did not analyze a sufficient number of instrument blanks, it is the opinion of the reviewer that carryover from samples containing high levels of gasoline may have contributed to the levels of gasoline detected in some of the project samples. Therefore, the detected results for gasoline in sample numbers LAY-SS06-S06, LAY-SS06-S02, and LAY-SS06-S11 are qualified "J" as estimated and usable for limited purposes.

K.3 No other problems were observed with compound quantitation and identification.

L. Conclusion:

L.1 Due to a large %RSD in the initial calibration and the lack of continuing calibrations for gasoline, all detected results and the PQL for all project samples are qualified "J" as estimated and usable for limited purposes.

L.2 Due to carryover from previous analyses, the PQL for sample numbers LAY-SS06-S03, LAY-SS06-S05, LAY-SS06-S07, LAY-SS06-S08, and LAY-SS06-S10 has been raised by the reviewer.

L.3 Due to carryover from previous analyses, the detected results for gasoline in some of the project samples may be artificially high.

L.4 Due to discrepancies between the detected results reported by the laboratory and the results calculated by the reviewer, the detected results for gasoline in some of the project samples have been changed on the data summary forms by the reviewer.

ICF KAISER
ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM:	POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY:	Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER:	Keith Strout
ANALYSIS:	HVOCs by USEPA Method 8010 and BTEX compounds by USEPA Method 8020
MATRIX:	Soil
DATE:	May 25, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (FBI) (Seattle, WA) received 12 soil samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 538). All of the samples required analysis for the halogenated volatile organic compounds (HVOCs) and the BTEX compounds by the volatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed on August 28, 1993 for HVOCs by USEPA Method 8010, and BTEX compounds by USEPA Method 8020.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC5-S01	417	Soil
LAY-AOC5-S02	419	Soil
LAY-AOC5-S03	421	Soil
LAY-AOC5-S04	423	Soil
LAY-AOC5-S05	425	Soil
LAY-AOC5-S06	427	Soil
LAY-AOC5-S07	429	Soil
LAY-BKGD-SD01	431	Soil
LAY-BKGD-S01	433	Soil
LAY-BKGD-S02	435	Soil
LAY-BKGD-S03	437	Soil
LAY-BKGD-S04	439	Soil

The following QC sample designations were included in project documentation: sample numbers LAY-AOC5-S01 and LAY-AOC5-S07 were designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared using the guidelines in the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Methods 8010 and 8020, and the Project Sampling and Analysis Plan.

It should be noted that all quantitation limits reported by the laboratory for HVOCs for project soil samples were higher than those specified in the Project Sampling and Analysis Plan. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by the State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory analyzed a five point initial calibration on system 3-4 on August 24, 1993. The range of the initial calibration was from 1 ppb to 1000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. Percent relative standard deviations (%RSDs) were calculated for all compounds using the calibration factors from the initial calibration using the FID detector. The % RSDs for the following compounds exceeded the recommended QC criteria of 20.0%.

Compound	% RSD
ethylbenzene	23.2 %
m & p-xylene	22.6 %

Due to the large percent RSDs, the detected results for these compounds, when quantitated using the FID, in the associated samples and blanks are qualified "J" as estimated and are usable for limited purposes.

B.2 The laboratory analyzed a four point initial calibration on system 3-4 on August 29, 1993. The range of the initial calibration was from 1 ppb to 1000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. Percent relative standard deviations (%RSDs) were calculated for all compounds using the calibration factors from the initial calibration using the FID detector. The % RSDs for the following compounds exceeded the recommended QC criteria of 20.0%.

Compound	% RSD
toluene	26 %
ethylbenzene	53 %
m & p-xylene	41 %
o-xylene	28 %

Due to the large percent RSDs, the detected results for these compounds, when quantitated using the FID, in the associated samples and blanks are qualified "J" as estimated and are usable for limited purposes.

C. Continuing Calibrations:

C.1 All QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 No target analytes were detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 No target analytes were detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted with this project sample set.

G. Field Replicate Analysis:

G.1 A QC limit for precision of ≤ 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.

G.2 Samples LAY-AOC5-S01 and LAY-AOC5-S07 were utilized for field replicate analysis. The detected results for benzene and xylene in the field replicate analyses exceeded the QC criteria. It is the opinion of the reviewer that the large variability between these two samples is due to interference from carryover in a previous sample. The detected results for the other target analytes met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate Analyses:

I.1 Sample number LON-SS01-S10-4 was used for the soil matrix spike/matrix spike duplicate analyses. This sample was from the Point Lonely site, not from the Point Lay site. It is the opinion of the reviewer that since the similarity of the soil type from each site is not described, it is not known what affect, if any, this will have on the quality of the data.

I.2 All of the matrix spike/matrix spike duplicate QC criteria were met and the results are considered acceptable.

J. System Performance:

J.1 The laboratory did not perform any instrument blanks between some of the samples which contained high levels of hydrocarbons. It is the opinion of the reviewer that this resulted in carryover and created interference with the quantitation of the BTEX compounds.

J.2 No other problems with system performance were observed for the project samples.

K. Quantitation and Identification:

K.1 The laboratory did not perform any instrument blanks between sample numbers LAY-AOC5-S06, LAY-AOC5-S07, and LAY-AOC5-S01 which contained high levels of hydrocarbons. It is the opinion of the reviewer that this resulted in carryover and created interference with the identification and quantitation of the BTEX compounds. Therefore, the detected results and the PQLs for the BTEX compounds in sample numbers LAY-AOC5-S07 and LAY-AOC5-S01 are qualified "R" as rejected and are unusable.

K.2 No other problems were observed with compound quantitation and identification.

L. Conclusion:

L.1 Due to large percent RSDs in the initial calibration, select data in some samples are qualified "J" as estimated and usable for limited purposes.

L.2 Due to carryover from a previous sample, the detected results and the PQLs for the BTEX compounds in sample numbers LAY-AOC5-S07 and LAY-AOC5-S01 are qualified "R" as rejected and are unusable.

L.3 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF Kaiser Engineers, Inc.
2700 Chandler Avenue, Building C
Las Vegas, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM:	POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY:	Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER:	Keith Strout
ANALYSIS:	HVOCs by USEPA Method 8010 and BTEX compounds by USEPA Method 8020
MATRIX:	Water and Soil
DATE:	May 18, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (FBI) (Seattle, WA) received 3 soil and 4 water samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 537). All of the samples required analysis for halogenated volatile organic compounds (HVOCs) and the BTEX compounds by the volatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed on August 24 through August 27, 1993 for HVOCs by USEPA Method 8010, and BTEX compounds by USEPA Method 8020.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-TB-01	441	Water
LAY-EB-01	443	Water
LAY-BKGD-SW01	448	Water
LAY-BKGD-SW02	461	Water
LAY-AOC5-SD01	463	Soil
LAY-AOC5-SD02	465	Soil
LAY-AOC5-SD03	467	Soil

The following QC sample designations were included in project documentation: sample number LAY-TB-01 was designated as a travel blank and sample number LAY-EB-01 was designated as an equipment blank.

The analytical results with qualifications are presented on modified sample data sheets

submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared using the guidelines in the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Methods 8010 and 8020, and the Project Sampling and Analysis Plan.

The analytical results for the soil samples were reported with an adjustment for moisture content.

It should be noted that all quantitation limits reported by the laboratory for HVOCs for project soil samples were higher than those specified in the Project Sampling and Analysis Plan. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by the State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory analyzed a five point initial calibration on system 1-2 on August 19, 1993. The range of the initial calibration was from 1 ppb to 1000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. Percent relative standard deviations (%RSDs) were calculated for all compounds using the calibration factors from the initial calibration using the FID detector. The % RSDs for the following compounds exceeded the recommended QC criteria of 20.0%.

Compound	% RSD
benzene	28.3 %
o-xylene	26.5 %

Due to the large percent RSDs, the detected results for these compounds in all project samples analyzed on system 1-2 when quantitated using the FID detector are qualified "J" as estimated and are usable for limited purposes.

B.2 The laboratory analyzed a five point initial calibration on system 3-4 on August 24, 1993. The range of the initial calibration was from 1 ppb to 1000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. Percent relative standard deviations (%RSDs) were calculated for all compounds using the calibration factors from the initial calibration using the FID detector. The % RSDs for the following compounds exceeded the recommended QC criteria of 20.0%.

Compound	% RSD
ethylbenzene	23.2 %
m & p-xylene	22.6 %

Due to the large percent RSDs, the detected results for these compounds in all

project samples analyzed on system 3-4 when quantitated using the FID detector are qualified "J" as estimated and are usable for limited purposes.

B.3 The laboratory was unable to demonstrate linearity throughout the quantitation range using the ECD detector on system 1-2 because the detector was saturated at low concentrations. It is the opinion of the reviewer that the ECD detector can be used only to confirm the presence of the halogenated compounds. Quantitation of the halogenated compounds should be done on the PID or FID detector when possible, and only if compound detection was confirmed on the ECD.

C. Continuing Calibrations:

C.1 The continuing calibrations on system 1-2 were performed at a concentration of 100 ppb. At this concentration, the system 1-2 ECD response for all of the halogenated compounds, including the surrogate BFB, is saturated. The ECD detector on system 1-2 should only be used to confirm the presence of the halogenated compounds. Therefore, the PQL for the HVOC compounds in all samples and blanks analyzed on system 1-2 are qualified "J" as estimated and are usable for limited purposes.

C.2 All other QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 No target analytes were detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 No target analytes were detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 Sample number LAY-TB-01 was designated as a travel blank and sample number LAY-EB-01 was designated as an equipment blank.

F.2 No target analytes were detected in the travel blank at a concentration above the PQL and the results are considered acceptable.

F.3 No target analytes were detected in the equipment blank at a concentration above the PQL and the results are considered acceptable.

G. Field Replicate Analysis:

G.1 There were no field replicate samples associated with this project sample set.

H. Surrogate Recoveries:

H.1 All of the surrogate QC recovery criteria were met and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate Analyses:

I.1 Sample number BTR-LF12-S03, which is not part of this project sample set but is from the Barter Island site, was used for the matrix spike/matrix spike duplicate analyses.

I.2 The recovery for tetrachloroethylene in the matrix spike duplicate analysis was 179% which exceeds the matrix spike recovery QA criteria. The analytical results are not qualified solely on the results of the matrix spike analyses.

I.3 All of the other matrix spike/matrix spike duplicate QC criteria were met and the results are considered acceptable.

J. System Performance:

J.1 The ECD detector on system 1-2 was saturated at the concentration level of the continuing calibrations and should only be used to confirm the presence of the HVOC compounds.

J.2 No other problems with system performance were observed for the project samples.

K. Quantitation and Identification:

K.1 The laboratory reported detected results for toluene, ethylbenzene, and xylene in sample number LAY-AOC5-SD02. The reported results for these analytes in this sample are from an analysis performed on August 24, 1993 which contained carryover from a previous high level sample. The laboratory reanalyzed this sample on August 27, 1993 and these analytes were not present in the sample at a concentration above the PQLs. Therefore, the results for toluene, ethylbenzene, and xylene in sample number LAY-AOC5-SD02 have been changed on the data summary form to reflect that these analytes were not detected at a concentration above the PQLs.

K.2 No other problems were observed with compound quantitation and identification.

L. Conclusion:

L.1 Due to performance problems with the ECD on system 1-2, the PQL for the HVOC compounds in all samples and blanks analyzed on system 1-2 are qualified "J" as estimated and usable for limited purposes.

L.2 Due to carryover from a previous sample, the laboratory reanalyzed sample number LAY-AOC5-SD02. However, the laboratory inadvertently reported the results from the contaminated analysis. Therefore, the data summary form has been changed by the reviewer to contain the results from the reanalysis.

L.3 Due to large percent RSDs in the initial calibration, select data in some samples are qualified "J" as estimated and usable for limited purposes.

L.4 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM: POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY: Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER: Keith Strout
ANALYSIS: HVOCs by USEPA Method 8010 and BTEX compounds by USEPA Method 8020
MATRIX: Soil
DATE: May 26, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (FBI) (Seattle, WA) received 15 soil samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 542). Eleven of the samples required analysis for the halogenated volatile organic compounds (HVOCs), and all of the samples required analysis for the BTEX compounds by the volatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The laboratory analyzed the samples for HVOCs by USEPA Method 8010 and the BTEX compounds by USEPA Method 8020 on August 26 and August 27, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC4-SD01	628	Soil
LAY-AOC4-SD02	630	Soil
LAY-AOC4-SD03	632	Soil
LAY-AOC4-SD04	634	Soil
LAY-SS06-S01	636	Soil
LAY-SS06-S02	638	Soil
LAY-SS06-S03	640	Soil
LAY-SS06-S04	642	Soil
LAY-SS06-S05	644	Soil
LAY-SS06-S06	646	Soil
LAY-SS06-S07	648	Soil
LAY-SS06-S08	650	Soil

ICF Site No.	Lab Sample No.	Matrix
LAY-SS06-S09	652	Soil
LAY-SS06-S10	654	Soil
LAY-SS06-S11	656	Soil

The following QC sample designation was included in project documentation: sample numbers LAY-SS06-S09 and LAY-SS06-S01 were designated as field replicates, and sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared using the guidelines in the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Methods 8010 and 8020, and the Project Sampling and Analysis Plan.

It should be noted that all quantitation limits reported by the laboratory for HVOCs for project soil samples were higher than those specified in the Project Sampling and Analysis Plan. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by the State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory analyzed a five point initial calibration on system 1-2 on August 19, 1993. The range of the initial calibration was from 1 ppb to 1000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. Percent relative standard deviations (%RSDs) were calculated for all compounds using the calibration factors from the initial calibration using the FID detector. The % RSDs for the following compounds exceeded the recommended QC criteria of 20.0%.

Compound	% RSD
benzene	28.3 %
o-xylene	26.5 %

Due to the large percent RSDs, the detected results for these compounds in all project samples are qualified "J" as estimated and are usable for limited purposes.

B.2 The laboratory was unable to demonstrate linearity throughout the

quantitation range using the ECD detector because the detector was saturated at low concentrations. It is the opinion of the reviewer that the ECD detector can be used only to confirm the presence of the halogenated compounds. Quantitation of the halogenated compounds should have been done on the PID or FID detector when possible, and only if compound detection was confirmed on the ECD. Therefore, the detected results and the practical quantitation limits (PQLs) for the halogenated compounds are qualified "J" as estimated and usable for limited purposes.

C. Continuing Calibrations:

C.1 The continuing calibrations were performed at a concentration of 500 ppb. At this concentration, the ECD response for all of the halogenated compounds is saturated. Therefore, the ECD detector should only be used to confirm the presence of the halogenated compounds.

C.2 All other QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 No target analytes were detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 No target analytes were detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted with this project sample set.

G. Field Replicate Analysis:

G.1 A QC limit for precision of $\leq$ 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.

G.2 Sample numbers LAY-SS06-S09 and LAY-SS06-S01 were utilized for field replicate analysis. The results of the field replicate analyses for target analytes 1,1,1-trichloroethane, trichloroethylene, toluene, tetrachloroethylene, ethylbenzene, and xylene exceeded the QC criteria. It is not known what effect, if any, this will have on the quality of the data.

G.3 Sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also utilized for field replicate analysis. The results of the field replicate analyses met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate Analyses:

I.1 Sample number LAY-SS06-S07 was used for the matrix spike/matrix spike duplicate analyses.

I.2 All of the matrix spike/matrix spike duplicate QC criteria were met and the results are considered acceptable.

J. System Performance:

J.1 It is the opinion of the reviewer that the ECD detector cannot be used for the quantitation of the halogenated compounds because the detector displayed saturation at low concentrations. The ECD detector can be used for halogenated compound identification confirmation.

J.2 The laboratory did not perform any instrument blanks between some of the samples which contained high levels of BTEX compounds. It is the opinion of the reviewer that this resulted in carryover and created interference causing an elevated baseline in some of the samples which probably did not contain BTEX compounds. Therefore, the PQLs for some of the BTEX compounds in sample numbers LAY-SS06-S05, LAY-SS06-S07, LAY-SS06-S10, and LAY-SS06-S06 have been adjusted to compensate for the carryover.

J.3 No other problems with system performance were observed for the project samples.

K. Quantitation and Identification:

K.1 Discrepancies exist between the detected amount reported by the laboratory and the amount calculated by the reviewer for certain target analytes in some of the project samples. Listed below are the detected results reported by the laboratory and the results regenerated by the reviewer for the analytes where discrepancies exist. Results are listed in parts per million (ppm).

ICF Site No.	Analyte	Laboratory Result	Validation Result
LAY-SS06-S03	tetrachloroethylene	21	1
LAY-SS06-S04	toluene	2	4
	ethylbenzene	7	14
	xylene	19	42
LAY-SS06-S02	toluene	1	3

The laboratory indicated that discrepancies are probably due to inconsistent quantitation procedures. The laboratory was unable to reproduce some of the reported detected results for which indicates that inconsistent quantitation procedures may have been used.

K.2 Because the laboratory did not analyze a sufficient number of instrument blanks, it is the opinion of the reviewer that carryover from samples containing high levels of organics may have contributed to the levels of target analytes detected in

some of the project samples. Therefore, the detected results for the BTEX compounds in sample numbers LAY-SS06-S06, LAY-SS06-S02, and LAY-SS06-S11 are qualified "J" as estimated and usable for limited purposes.

K.3 Compound identification was confirmed using a second column and an alternate detector.

K.4 No other problems were observed for compound quantitation and identification.

L. Conclusion:

L.1 Due to large percent RSDs in the initial calibration, select data in some samples are qualified "J" as estimated and usable for limited purposes.

L.2 Due to carryover from previous analyses, the PQLs for some of the BTEX compounds in sample numbers LAY-SS06-S05, LAY-SS06-S07, LAY-SS06-S10, and LAY-SS06-S06 have been raised by the reviewer on the data summary forms.

L.3 Due to carryover from previous analyses, the detected results for some of the BTEX compounds in some of the project samples may be artificially high.

L.4 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM:	POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY:	Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER:	Clyde Hedin
ANALYSIS:	Pesticides by USEPA Method 8080
MATRIX:	Water
DATE:	June 16, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 11 water samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 545) were requested for pesticide analysis by the pesticide organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for pesticides by USEPA Method 8080 on August 27, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-EB02	557	Water
LAY-LF01-SW04	562	Water
LAY-LF01-SW08	565	Water

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document " National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

The following QC sample designations were included in project documentation: sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were designated as field duplicates.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory performed a five point initial calibration on GC instrument ICF5 on August 21, 1993. The range of the initial calibration was from 0.01 ppm to 1.0 ppm. The percent relative standard deviations (%RSDs) were calculated for all compounds using calibration factors determined from the initial calibration using the ECD detector. The %RSDs for the following target analytes exceeded the recommended QC criteria of 20.0%.

Compound	%RSD
Beta-BHC	21.7

All detected results for this analyte in the samples are qualified "J" as estimated and usable for limited purposes.

B.2 Methoxychlor was spiked in at concentrations too low to be detected by the ECD detector until the 0.5 ppm initial calibration standard. All detected results for this analyte are qualified "R" as rejected and unusable, and the PQL is adjusted accordingly.

C. Continuing Calibration:

C.1 No continuing calibrations were analyzed during the sequence with the exception of the column degradation solution containing Endrin and DDT. The stability of the instrument, GC column, and detector were monitored using the Endrin, and DDT column degradation solution and the Aroclor 1254 continuing calibration calibration solution. These two solutions were used to check area consistency and surrogate area stability. It is the opinion of the reviewer, that since no pesticide continuing calibration solutions were analyzed, this is the only criteria that can be used to monitor system performance.

Due to the absence of pesticide continuing calibrations, the PQLs for all method blanks and samples are qualified "J" as estimated and usable for limited purposes.

D. Laboratory Blanks:

D.1 There were no laboratory blanks submitted for analyses with the pesticide fraction.

E. Instrument Blanks:

E.1 Target analytes were not detected in the instrument blank at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted for analyses with the pesticide fraction.

G. Field Duplicate Analyses:

G.1 A QC limit for precision of ≤20%, as measured by Relative Percent Difference (RPD) between water sample values, was specified for field duplicate

comparability.

G.2 Samples LAY-LF01-SW04 and LAY-LF01-SW08 were utilized for field duplicate analysis. The results of the field duplicate analyses met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate:

I.1 No matrix spike and matrix spike duplicate analyses were performed for the pesticide fraction.

J. System Performance:

J.1 The laboratory set up the GC analytical run time on the primary GC column to elute all pesticide analytes within 9 minutes, causing co-elution of numerous pesticides and making identification difficult. A slower temperature program and/or slower carrier gas flow rate would increase resolution for many of the pesticide analytes.

J.2 The Endrin and 4,4'-DDT breakdown met QC criteria and the results are considered acceptable.

J.3 No other problems with system performance were observed for all other project sample analyses.

K. Quantitation and Identification:

K.1 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.

K.2 The PQLs for all pesticide analytes in all project samples were reported incorrectly. The reviewer corrected the pesticide PQLs on the data summary report forms.

K.3 No other problems with compound quantitation and identification were observed.

L. Conclusion:

L.1 No target analytes were detected at a concentration above the PQLs in the method blank and the samples.

L.2 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.

L.3 The PQLs for all pesticide analytes in all project samples were reported incorrectly. The reviewer corrected the pesticide PQLs on summary report forms.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM:	POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY:	Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER:	Timothy Vonnahme
ANALYSIS:	Pesticides by USEPA Method 8080
MATRIX:	Soil
DATE:	June 3, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 12 soil samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 538). Seven of the samples were requested for pesticide analysis by the pesticide organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for pesticides by USEPA Method 8080 on August 24, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC5-S01	417	Soil
LAY-AOC5-S07	429	Soil
LAY-BKGD-SD01	431	Soil
LAY-BKGD-S01	433	Soil
LAY-BKGD-S02	435	Soil
LAY-BKGD-S03	437	Soil
LAY-BKGD-S04	439	Soil

The quantitation limits reported by the laboratory for the soil samples (0.02 ppm) were lower than those specified in the Project Sampling and Analysis Plan (0.05 ppm). It is the opinion of the reviewer that the quality of the data was not affected.

The following QC sample designations were included in project documentation: sample numbers LAY-AOC5-S01 and LAY-AOC5-S07 were designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document " National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory performed a five point initial calibration on GC instrument ICF5 on August 21, 1993. The range of the initial calibration was from 0.01 ppm to 1.0 ppm. The percent relative standard deviations (%RSDs) were calculated for all compounds using calibration factors determined from the initial calibration using the ECD detector. The %RSD for the following target analyte exceeded the recommended QC criteria of 20.0%

Compound	%RSD
beta-BHC	22%

All detected results for beta-BHC in the samples are qualified "J" as estimated and usable for limited purposes.

B.2 Methoxychlor was spiked in at concentrations too low to be detected by the ECD detector until the 0.5 ppm initial calibration standard. All detected results for this analyte are qualified "R" as rejected and unusable, and the PQL is adjusted accordingly.

C. Continuing Calibration:

C.1 No continuing calibrations were analyzed during the sequence with the exception of the column degradation solution containing Endrin and DDT. The stability of the instrument, GC column, and detector were monitored using the Endrin and DDT column degradation solution and the Aroclor 1254 continuing calibration solution. These two solutions were used to check area consistency and surrogate area stability. It is the opinion of the reviewer, that since no pesticide continuing calibration solutions were analyzed, this is the only criteria that can be used to monitor system performance.

Due to the absence of pesticide continuing calibrations, the practical quantitation limits (PQLs) for all method blanks and samples are qualified "J" as estimated and

usable for limite d purposes .

D. Laboratory Blanks:

D.1 The laboratory did not report the pesticide results for the method blank associated with this sample set. The reviewer modified the sample report summary form to included the pesticide results for the soil method blank. Target analytes were not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Target analytes were not detected in the instrument blank at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blank analyses associated with this project sample set.

G. Field Replicate Analyses:

G.1 A QC limit for precision of $\leq$ 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.

G.2 Samples LAY-AOC5-S01 and LAY-AOC5-S07 were utilized for field replicate analysis. The results of the field replicate analyses, as reported by the laboratory, met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate:

I.1 No matrix spike and matrix spike duplicate analyses were performed for the pesticide fraction.

J. System Performance:

J.1 The laboratory set up the GC analytical run time on the primary GC column to elute all pesticide analytes within 9 minutes, causing co-elution of numerous pesticides and making identification difficult. A slower temperature program and/or slower carrier gas flow rate would increase resolution for many of the pesticide analytes.

J.2 The Endrin and 4,4'-DDT breakdown met QC criteria and the results are considered acceptable.

J.3 No other problems with system performance were observed for all other project sample analyses.

K. Quantitation and Identification:

K.1 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.

K.2 Due to biological interference present in all the samples, the PCLs have been raised to 0.02 ppb by the laboratory.

K.3 Due to sensitivity problems with methoxychlor in the initial calibration, the PQL was raised by the reviewer to 0.5 ppb for the soil samples.

K.4 No other problems with compound quantitation and identification were observed.

L. Conclusion:

L.1 No target analytes were detected at a concentration above the PQLs in the method blank and the samples.

L.2 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.

L.3 The laboratory raised the PQLS of the pesticide analytes to 0.02 ppb for all the samples due to biological interference.

L.4 Due to sensitivity problems with methoxychlor in the initial calibration, the PQL of this analyte was raised by the reviewer to 0.5 ppb for the soil samples.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM:	POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY:	Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER:	Timothy Vonnahme
ANALYSIS:	Pesticides by USEPA Method 8080
MATRIX:	Water
DATE:	May 25, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 3 soil and 4 water samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 537). Three of the water samples were requested for pesticide analysis by the pesticide organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for pesticides by USEPA Method 8080 on August 25, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-EB-01	446	Water
LAY-BKGD-SW01	457	Water
LAY-BKGD-SW02	462	Water

The following QC sample designations were included in project documentation: sample number LAY-EB-01 was designated as an equipment blank.

The Instrument Number-Sequence Date on the data summary form for water samples LAY-EB-01, LAY-BKGD-SW01, and LAY-BKGD-SW02 were inadvertently recorded by the laboratory as ICF5 08-25-93 instead of ICF6 08-23-93.

The quantitation limits reported by the laboratory for the water samples (2 ppb) were lower than those specified in the Project Sampling and Analysis Plan (2.5 ppb). Since the low point of the initial calibration is 0.01 ppm, the PQL should be 0.2 ppb. The PQLs have been corrected on the data summary forms by the reviewer.

The analyt ical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document " National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QDCcriteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory performed a five point initial calibration on GC Instrument ICF6 on August 21, 1993. The range of the initial calibration was from 0.01 ppm to 1.0 ppm. Percent relative standard deviations (%RSDs) were calculated for all compounds using calibration factors determined from the initial calibration using the EC detector. The %RSDs for the following target analytes exceeded the recommended QC criteria of 20.0%

Compound	%RSD
Endosulfan II	38%
Endrin Aldehyde	31%
DDT/Endosulfan Sulfate	32%
Endrin Ketone	33%

Due to the large percent RSDs, the detected results for these compounds are qualified "J" as estimated and are usable for limited purposes.

B.2 Methoxychlor was spiked in at concentrations too low to be detected by the ECD detector until the 0.5 ppm initial calibration standard. All detected results for this analyte are qualified "R" as rejected and unusable, and the PQL is adjusted accordingly.

C. Continuing Calibration:

C.1 No continuing calibrations were analyzed during the sequence with the exception of the column degradation solution containing Endrin and DDT. The stability of the instrument, GC column, and detector were monitored using the Endrin and DDT column degradation solution and the Aroclor 1254 continuing calibration solution. These two solutions were used to check area consistency and surrogate area stability. It is the opinion of the reviewer, that since no pesticide continuing calibration solutions were analyzed, this is the only criteria that can be used to monitor system performance.

Due to the absence of pesticide continuing calibrations, the PQLs for all method blanks and samples are qualified "J" as estimated and usable for limited purposes.

D. Laboratory Blanks:

D.1 Target analytes were not detected in the method blank at a concentration

above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Target analytes were not detected in the instrument blank at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 Sample number LAY-EB-02 was designated as an equipment blank.

F.2 Pesticide target analytes were not detected in the equipment blank at a concentration above the PQL and the results are considered acceptable.

G. Field Replicate Analyses:

G.1 There were no field replicates submitted for analyses with the pesticide fraction.

H. Surrogate Recoveries:

H.1 A discrepancy exists between the surrogate recovery reported by the laboratory (80%) and the surrogate recovery calculated by the reviewer (166%) for project sample LAY-BKGD-SW02. The reviewer calculated the recovery of the surrogate using the reference area of the surrogate from the closest continuing calibration standard.

H.2 All other surrogate recoveries met QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate:

I.1 No matrix spike and matrix spike duplicate analyses were performed for the pesticide fraction.

J. System Performance:

J.1 The laboratory set up the GC analytical run time on the primary GC column to elute all pesticide analytes within 9 minutes, causing co-elution of numerous pesticides, and making identification difficult. A slower temperature program and/or slower carrier gas flow rate would increase resolution for many of the pesticide analytes.

J.2 The Endrin and 4,4'-DDT breakdown met QC criteria and the results are considered acceptable.

J.3 No other problems with system performance were observed for all other project sample analyses.

K. Quantitation and Identification:

K.1 The laboratory reported incorrect PQLs for the project water samples. They have been corrected on the data summary form by the reviewer.

K.2 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.

K.3 The surrogate recovery for sample LAY-BKGD-SW02 exceeded the QC criteria on the high side as calculated by the reviewer. It is the opinion of the reviewer that the quality of the data was not affected.

K.4 No other problems with compound quantitation and identification were observed.

L. <u>Conclusion:</u>

L.1 No target analytes were detected at a concentration above the PQLs in the method blank and the samples.

L.2 The PQLs for the water samples have been adjusted on the data summary forms by the reviewer.

L.3 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM: POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY: Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER: Timothy Vonnahme
ANALYSIS: Pesticides by USEPA Method 8080
MATRIX: Soil
DATE: June 3, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 15 soil samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 542). Two of the samples were requested for pesticide analysis by the pesticide organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for pesticides by USEPA Method 8080 on August 26, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-SS06-S03	640	Soil
LAY-SS06-S08	650	Soil

The quantitation limits reported by the laboratory for the soil samples (0.02 ppm) were lower than those specified in the Project Sampling and Analysis Plan (0.05 ppm). It is the opinion of the reviewer that the quality of the data was not affected.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document " National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory performed a five point initial calibration on GC instrument ICF5 on August 21, 1993. The range of the initial calibration was from 0.01 ppm to 1.0 ppm. The percent relative standard deviations (%RSDs) were calculated for all compounds using calibration factors determined from the initial calibration using the ECD detector. The %RSD for the following target analyte exceeded the recommended QC criteria of 20.0%

Compound	%RSD
beta-BHC	22%

All detected results for beta-BHC in the samples are qualified "J" as estimated and usable for limited purposes.

B.2 Methoxychlor was spiked in at concentrations too low to be detected by the ECD detector until the 0.5 ppm initial calibration standard. All detected results for this analyte are qualified "R" as rejected and unusable, and the PQL is adjusted accordingly.

C. Continuing Calibration:

C.1 No continuing calibrations were analyzed during the sequence with the exception of the column degradation solution containing Endrin and DDT. The stability of the instrument, GC column, and detector were monitored using the Endrin and DDT column degradation solution and the Aroclor 1254 continuing calibration solution. These two solutions were used to check area consistency and surrogate area stability. It is the opinion of the reviewer, that since no pesticide continuing calibration solutions were analyzed, this is the only criteria that can be used to monitor system performance.

Due to the absence of pesticide continuing calibrations, the practical quantitation limits (PQLs) for all method blanks and samples are qualified "J" as estimated and usable for limited purposes.

D. Laboratory Blanks:

D.1 The laboratory did not report the pesticide results for the method blank associated with this sample set. The reviewer modified the sample report summary form to included the pesticide results for the soil method blank. Target analytes were not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Target analytes were not detected in the instrument blank at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blank analyses associated with this project sample set.

G. Field Replicate Analyses:

G.1 There were no field replicate samples submitted for analyses for the pesticide fraction.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate:

I.1 No matrix spike and matrix spike duplicate analyses were performed for the pesticide fraction.

J. System Performance:

J.1 The laboratory set up the GC analytical run time on the primary GC column to elute all pesticide analytes within 9 minutes, causing co-elution of numerous pesticides and making identification difficult. A slower temperature program and/or slower carrier gas flow rate would increase resolution for many of the pesticide analytes.

J.2 The Endrin and 4,4'-DDT breakdown met QC criteria and the results are considered acceptable.

J.3 No other problems with system performance were observed for all other project sample analyses.

K. Quantitation and Identification:

K.1 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.

K.2 Due to biological interference present in all the samples, the PCLs have been raised to 0.02 ppb by the laboratory.

K.3 Due to sensitivity problems with methoxychlor in the initial calibration, the PQL was raised by the reviewer to 0.5 ppb for the soil samples.

K.4 The laboratory did not report the pesticide results for the method blank associated with this sample set. The reviewer modified the data summary form to included the pesticide results for the soil method blank. Target analytes were not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

K.5 No other problems with compound quantitation and identification were observed.

L. Conclusion:

L.1 No target analytes were detected at a concentration above the PQLs in the

method blank and the samples.

L.2 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.

L.3 The laboratory raised the PQLS of the pesticide analytes to 0.02 ppb for all the samples due to biological interference.

L.4 Due to sensitivity problems with methoxychlor in the initial calibration, the PQL of this analyte was raised by the reviewer to 0.5 ppb for the soil samples.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM: POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY: Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER: Clyde Hedin
ANALYSIS: Polychlorinated Biphenyls (PCBs) by USEPA Method 8080.
MATRIX: Water
DATE: June 15, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 11 water samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 545). Nine of the samples were requested for PCB analysis by the PCB organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for PCBs by USEPA Method 8080 (GC/ECD) on August 27, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-EB02	557	Water
LAY-LF01-SW01	559	Water
LAY-LF01-SW02	560	Water
LAY-LF01-SW03	561	Water
LAY-LF01-SW04	562	Water
LAY-LF01-SW05	563	Water
LAY-LF01-SW06	564	Water
LAY-LF01-SW07	565	Water
LAY-LF01-SW08	566	Water

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document " National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

The following QC sample designations were included in project documentation: sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were designated as field duplicates.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory performed a five point initial calibration on GC Instrument ICF5 on August 21, 1993. All samples were quantitated using a linear regression curve calculated from the initial calibration. The range of the initial calibration was from 0.1 ppm to 10 ppm. A percent relative standard deviation (%RSD) of 37.2% was calculated using calibration factors determined from the initial calibration. The %RSD of 37.2 exceeds the recommended method criteria of 20.0%, therefore, the detected results for PCBs in the project samples are qualified "J" as estimated and usable for limited purposes.

C. Continuing Calibration:

C.1 All QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 PCBs were not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 PCBs were not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted for analysis with this project sample set.

G. Field Duplicate Analyses:

G.1 A QC limit for precision of $\leq$ 20%, as measured by Relative Percent Difference (RPD) between water sample values, was specified for field duplicate comparability.

G.2 Samples LAY-LF01-SW04 and LAY-LF01-SW08 were utilized for field duplicate analysis. The results of the field duplicate analyses, as reported by the laboratory, met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate:

I.1 Tap water was used as the matrix spike/matrix spike duplicate sample.

I.2 All matrix spike/matrix spike duplicate met applicable QC criteria and the results are considered acceptable.

J. System Performance:

J.1 No problems with system performance were observed for the project sample analyses.

K. Quantitation and Identification:

K.1 No problems with compound quantitation and identification were observed for this project sample set.

L. Conclusion:

L.1 PCBs were not detected at concentrations above the PQL of the PCBs in the method blank and the samples.

L.2 All data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM: WAINWRIGHT / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY: Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER: Timothy Vonnahme
ANALYSIS: Polychlorinated Biphenyls (PCBs) by USEPA Method 8080.
MATRIX: Soil
DATE: June 1, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 12 soil samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 538) for PCB analysis by the PCB organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for PCBs by USEPA Method 8080 (GC/ECD) on August 24, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC5-S01	417	Soil
LAY-AOC5-S02	419	Soil
LAY-AOC5-S03	421	Soil
LAY-AOC5-S04	423	Soil
LAY-AOC5-S05	425	Soil
LAY-AOC5-S06	427	Soil
LAY-AOC5-S07	429	Soil
LAY-BKGD-SD01	431	Soil
LAY-BKGD-S01	433	Soil
LAY-BKGD-S02	435	Soil
LAY-BKGD-S03	437	Soil
LAY-BKGD-S04	439	Soil

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This

report was prepared in accordance with the USEPA draft document " National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory performed a five point initial calibration on GC Instrument ICF5 on August 21, 1993. All samples were quantitated using a linear regression curve calculated from the initial calibration. The range of the initial calibration was from 0.1 ppm to 10 ppm. A percent relative standard deviation (%RSD) of 37.2% was calculated using calibration factors determined from the initial calibration. The %RSD of 37.2 exceeds the recommended method criteria of 20.0%, therefore, the detected results for PCBs in the project samples are qualified "J" as estimated and usable for limited purposes.

C. Continuing Calibration:

C.1 All QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 The laboratory reported a PQL for the PCBs of 0.5 ppm instead of 0.1 ppm for the method blank. The corrected PQLs were adjusted on the data summary form by the reviewer. PCBs were not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 PCBs were not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted for analysis with this project sample set.

G. Field Replicate Analyses:

G.1 A QC limit for precision of $\leq$ 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.

G.2 Samples LAY-AOC5-S01 and LAY-AOC5-S07 were utilized for field replicate analysis. The results of the field replicate analyses, as reported by the laboratory, met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate:

I.1 Sample number LAY-AOC5-S06 was used as the matrix spike/matrix spike duplicate sample.

I.2 All matrix spike/matrix spike duplicate met applicable QC criteria and the results are considered acceptable.

J. System Performance:

J.1 No problems with system performance were observed for the project sample analyses.

K. Quantitation and Identification:

K.1 The PQL for the PCBs in the method blank and LAY-AOC5-S06 DUP were reported incorrectly at 0.5 ppm by the laboratory. They have been adjusted to 0.1 ppm on the data summary form by the reviewer.

K.2 The PQL for the PCBs in samples, LAY-BKGD-S02 and LAY-BKGD-S03 were reported incorrectly at 0.1 ppm by the laboratory due to failure to incorporate the percent moisture calculation into the PQL result of the samples. They have been adjusted to 0.2 ppm on the data summary form by the reviewer.

K.3 No other problems with compound quantitation and identification were observed for this project sample set.

L. Conclusion:

L.1 PCBs were not detected at a concentration above the PQL of the PCBs in the method blank and the samples.

L.2 The laboratory reported incorrect PQLs for the method blank, LAY-AOC5-S06 DUP, and samples LAY-BKGD-S02 and LAY-BKGD-S03. They have been adjusted on the data summary forms by the reviewer.

L.3 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM:	POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY:	Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER:	Timothy Vonnahme
ANALYSIS:	Polychlorinated Biphenyls (PCBs) by USEPA Method 8080.
MATRIX:	Water and Soil
DATE:	May 25, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 3 soil and 4 water samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 537). Six of the samples were requested for polychlorinated biphenyls (PCBs) analysis by the PCB organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for PCBs by USEPA Method 8080 (GC/ECD) on August 24 and August 25, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-EB-01	446	Water
LAY-BKGD-SW01	457	Water
LAY-BKGD-SW02	462	Water
LAY-AOC5-SD01	463	Soil
LAY-AOC5-SD02	465	Soil
LAY-AOC5-SD03	467	Soil

The following QC sample designations were included in project documentation: sample number LAY-EB-01 was designated as an equipment blank.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The Instrument Number-Sequence Date on the data summary form for water samples LAY-EB-01, LAY-BKGD-SW01, and LAY-BKGD-SW02 were inadvertently recorded by the laboratory as ICF5 08-25-93 instead of ICF6 08-23-93.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document " National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory performed a five point initial calibration on GC Instrument ICF5 on August 21, 1993. All samples were quantitated using a linear regression curve calculated from the initial calibration. The range of the initial calibration was from 0.1 ppm to 10 ppm. A percent relative standard deviation (%RSD) of 37.2% was calculated using calibration factors determined from the initial calibration. The %RSD of 37.2 exceeds the recommended method criteria of 20.0%, therefore, the detected results for PCBs in the project soil samples are qualified "J" as estimated and usable for limited purposes.

B.2 The laboratory performed a five point initial calibration on GC instrument ICF6 on August 21, 1994. The range of the initial calibration was from 0.1 ppm to 10 ppm. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 30.3% was calculated using calibration factors determined from the initial calibration. The %RSD of 30.3 exceeds the recommended method criteria of 20.0%, therefore, the detected results for PCBs in the project water samples are qualified "J" as estimated and usable for limited purposes.

C. Continuing Calibration:

C.1 All QC criteria for the continuing calibrations from both instruments were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 PCBs were not detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 PCBs were not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 Sample number LAY-EB-02 was designated as an equipment blank.

F.2 PCBs were not detected in the equipment blank at a concentration above the PQL and the results are considered acceptable.

G. Field Replicate Analyses:

G.1 There were no field replicate samples associated with this project sample set.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate:

I.1 Sample number LAY-AOC5-S06 was used for the soil matrix spike/matrix spike duplicate analyses. The sample was not included on chain-of-custody 537.

I.2 All matrix spike/matrix spike duplicate QC criteria were met and the results are considered acceptable.

J. System Performance:

J.1 No problems with system performance were observed for the project sample analyses.

K. Quantitation and Identification:

K.1 The laboratory did not report the correct PQLs for the soil method blank and samples. The PQLs have been adjusted on the data summary forms by the reviewer.

K.2 The Instrument Number-Sequence Date on the data summary form for water samples LAY-EB-01, LAY-BKGD-SW01, and LAY-BKGD-SW02 were inadvertently recorded by the laboratory as ICF5 08-25-93 instead of ICF6 08-23-93.

K.3 No other problems with compound quantitation and identification were observed for this project sample set.

L. Conclusion:

L.1 PCBs were not detected at a concentration above the PQL in the method blanks and the samples.

L.2 The PQL for the PCBs in the soil method blank and the samples have been adjusted on the data summary form by the reviewer.

L.3 All other data are considered valid and usable for all purposes.

ICF KAISER
ENGINEERS

ICF KAISER ENGINEERS, INC.
2700 CHANDLER AVENUE, BUILDING C
LAS VEGAS, NV 89120
702/795-0515

DATA VALIDATION REPORT

PROGRAM: POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)
LABORATORY: Friedman & Bruya, Inc. (Seattle, WA)
REVIEWER: Timothy Vonnahme
ANALYSIS: Polychlorinated Biphenyls (PCBs) by USEPA Method 8080.
MATRIX: Soil
DATE: June 14, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 15 soil samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 542). Eleven of the samples were requested for PCB analysis by the PCB organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for PCBs by USEPA Method 8080 (GC/ECD) on August 26, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-SS06-S01	636	Soil
LAY-SS06-S02	638	Soil
LAY-SS06-S03	640	Soil
LAY-SS06-S04	642	Soil
LAY-SS06-S05	644	Soil
LAY-SS06-S06	646	Soil
LAY-SS06-S07	648	Soil
LAY-SS06-S08	650	Soil
LAY-SS06-S09	652	Soil
LAY-SS06-S10	654	Soil
LAY-SS06-S11	656	Soil

The following QC sample designation was included in project documentation: sample numbers LAY-SS06-S09 and LAY-SS06-S01 were designated as field replicates, and sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document " National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory performed a five point initial calibration on GC Instrument ICF5 on August 21, 1993. All samples were quantitated using a linear regression curve calculated from the initial calibration. The range of the initial calibration was from 0.1 ppm to 10 ppm. A percent relative standard deviation (%RSD) of 37.2% was calculated using calibration factors determined from the initial calibration. The %RSD of 37.2 exceeds the recommended method criteria of 20.0%, therefore, the detected results for PCBs in the project samples are qualified "J" as estimated and usable for limited purposes.

C. Continuing Calibration:

C.1 All QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 The laboratory reported a water PQL for the PCBs of 10 ppb instead of 0.1 ppm for the soil method blank. The corrected PQLs were adjusted on the data summary form by the reviewer. PCBs were not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 PCBs were not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted for analysis with this project sample set.

G. Field Replicate Analyses:

G.1 A QC limit for precision of $\leq$ 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate

comparability.

G.2 Sample numbers LAY-SS06-S09 and LAY-SS06-S01 were utilized for field replicate analysis. The results of the field replicate analyses met all applicable QC criteria and the results are considered acceptable.

G.3 Sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also utilized for field replicate analysis. The results of the field replicate analyses met all applicable QC criteria and the results are considered acceptable.

H. <u>Surrogate Recoveries:</u>

H.1 The laboratory did not report a surrogate recovery for sample LAY-SS06-S10, but was calculated as 74% by the reviewer. The corrected result has been adjusted on the data summary form by the reviewer.

H.2 The laboratory surrogate recoveries of 220% for sample LAY-SS06-S09 and 160% for sample LAY-SS06-S11. These same recoveries when calculated by the reviewer were 134% and 99% respectively.

H.3 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. <u>Matrix Spike/Matrix Spike Duplicate:</u>

I.1 Sample number LAY-SS06-S07 was used as the matrix spike/matrix spike duplicate sample.

I.2 All matrix spike/matrix spike duplicate met applicable QC criteria and the results are considered acceptable.

J. <u>System Performance:</u>

J.1 No problems with system performance were observed for the project sample analyses.

K. <u>Quantitation and Identification:</u>

K.1 The laboratory reported a water method blank with PQLs of 10 ppb. It has been corrected on the data summary forms by the reviewer.

K.2 The PQL for the PCBs in samples LAY-SS06-S01, LAY-SS06-S02, and LAY-SS06-S09 was raised to 0.5 ppm on the data summary forms by the reviewer due to interference present in the samples. The PQL for the PCBs in sample LAY-SS06-S08 was raised to 0.2 ppm due to interference present in the sample, and the PQL for the PCBs in sample LAY-SS06-S06 was also raised to 0.2 ppm by the reviewer due to a moisture content of 49% that was not incorporated into the PQL calculation of the PCBs by the laboratory.

K.3 The laboratory did not report a surrogate recovery for sample LAY-SS06-S10, but was calculated as 74% by the reviewer. The corrected result has been adjusted

on the data summary form by the reviewer. The laboratory surrogate recoveries of 220% for sample LAY-SS06-S09 and 160% for sample LAY-SS06-S11. These same recoveries when calculated by the reviewer were 134% and 99% respectively.

K.4 No other problems with compound quantitation and identification were observed for this project sample set.

L. Conclusion:

L.1 PCBs were not detected at a concentration above the PQL of the PCBs in the method blank and the samples.

L.2 The reviewer raised the PQL on the data summary forms for the PCBs in samples LAY-SS06-S01, LAY-SS06-S02, and LAY-SS06-S09, LAY-SS06-S08 due to interference present in the samples.

L.3 The reviewer raised the PQL on the data summary form for sample LAY-SS06-S06 because the moisture content of the sample was not included in the PQL calculation.

L.4 All other data are considered valid and usable for all purposes.